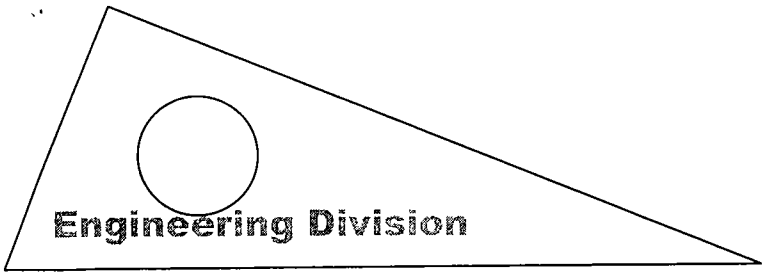


Braintree Public Works

Robert P. Campbell, PE, Town Engineer
Rcampbell@townofbraintreegov.org
John J. Morse, Assistant Town Engineer
Jmorse@townofbraintreegov.org

February 13, 2007

Ann Herrick - CIP
U. S. Environmental Protection Agency – Region 1
1 Congress Street, Suite 1100
Boston, MA 02114-2023

Massachusetts Department of Environmental Protection
Division of Watershed Management
627 Main Street
Worcester, MA 01608

Enclosed please find our NPDES Phase II Small MS4 General Permit Annual Report Number 2, covering the period of March of 2004 to March of 2005.

Very truly yours,

Robert P. Campbell, P. E.
Town Engineer

Municipality/Organization: **Town of Braintree, MA**

EPA NPDES Permit Number:

MaDEP Transmittal Number: **W-041000 (for No.1)**

Annual Report Number & Reporting Period: **No. 2: March 2004-March 2005**

NPDES PII Small MS4 General Permit Annual Report

Part I. General Information

Contact Person: Bob Campbell Title: Town Engineer

Telephone #: 781-794-8010 Email: rcampbell@beld.net

Certification:

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: Robert P. Campbell

Printed Name: Robert P. Campbell, P.E.

Title: Town Engineer

Date: February 13, 2007

Part II. Self-Assessment

In pursuing our self assessment it became clear that we had not communicated between departments sufficiently either in the preparation of our initial Phase 2 permit application or in subsequent implementation. We are not reneging on any of our commitments. Rather we have found that many of the things we said we'd do had already been done, even before Phase 2 came into effect. As evidence, I've attached in full a memo from the Town's Director of Planning and Conservation. I've also inserted applicable sections of the memo into the permit Tables, as appropriate.

The Town of Braintree is committed to protection of our water resources and is in compliance with all permit conditions, except for the following provisions:

As part of PE 2 we were to distribute brochures at the July 4th Town Fair. The status of the Town Fair was in a state of flux and before we knew it, there was no time to get the brochure distributed.

As part of ID 1 we were to determine essential fish habitation and determine historical location impacts. Those have not been accomplished yet.

PART III. Summary of Minimum Control Measures.

1. Public Education and Outreach

BMP ID#	Best Management Practice/*Responsible Dept.* – *Contact*	Measurable Goals: Year 2 (March 2004 to March 2005)	Annual Report Status	Year 3 (March 2005 to March 2006)	Year 4 (March 2006 to March 2007)	Year 5 (March 2007 to March 2008)
PE 1	**Partner w/ local organization/** ***Peter Lapolla – Planning/ConCom***	-	Since 2003, the Department has worked with the Fore River Watershed Association in staffing a river monitoring station located in the Monatiquot River and in approaching the Division of Marine Fisheries regarding re-establishing a herring run in the Monatiquot River. The Department will continue to partner with the Association on a project-by-project basis as opportunities arise.	Continue partnership	-	Continue partnership
PE 2	**Develop public education brochures/press releases/** ***John McMahon - DPW***	Distribute fliers to abutters of pavement projects to address SSO issues. Brochure distribution at July 4th Town Fair	Fliers hand delivered to abutters of each paving project Due to uncertainty with Town Fair, brochures were not prepared in time.	Distribute fliers to abutters of pavement projects to address SSO issues. Brochure distribution at July 4th Town Fair	Distribute fliers to abutters of pavement projects to address SSO issues. Brochure distribution at July 4th Town Fair	Distribute fliers to abutters of pavement projects to address SSO issues. Brochure distribution at July 4th Town Fair
PE 3	**Classroom instruction/** ***Peter Lapolla –Planning/ConCom***	Present proposed workshop plan to Pond Meadow Park Summer Camp for storm water education	The Department of Planning and Conservation has scheduled to develop a storm water education program for Pond Meadow's summer camp and plans to implement the program in Summer 2007.	Prepare storm water education	Present storm water education	Present storm water education
PE 4	**Develop web page/** ***Mike Steen - MIS***	Post SWMP and brochures on existing website	Not completed	Maintain and update webpage	Maintain and update webpage	Maintain and update webpage
PE 5	**Cable Access TV Show/** ***John McMahon -DPW***	-		Begin creation of one storm water cable access program	Finalize outline and text for cable access episode	1 Cable access episode devoted to Storm Water

2. Public Involvement and Participation

BMP ID#	Best Management Practice/*Responsible Dept. – Contact*	Measurable Goals: Year 2 (March 2004 to March 2005)	Annual Report Status	Year 3 (March 2005 to March 2006)	Year 4 March 2006 to March 2007)	Year 5 (March 2007 to March 2008)
PP 1, PP 2	**Partner w/ local organization/** ***Peter Lapolla –Planning/ConCom***	Form partnership with 1 org (watershed or Boy/Girl Scout)	In addition to 2.1, the Department of Planning and Conservation has had an on-going relationship with the Braintree Eagle Scout Program which continues on a project-by-project basis. The Department has worked with the Eagle Scouts to maintain a trail system in the Town's Cranberry Pond Area of Critical Environmental Concern. Town Engineer / Town Forest committee partnered with the Eagle Scouts to rehabilitate a small dam in Town Forest that had fallen into disrepair. The Department of Planning and Conservation secured funding from the Conservation Commission for a stenciling program and has discussed with Eagle Scout leaders the possibility of implementing said program in 2007.	Identify one priority area for storm drain stenciling program and continue partnership	Continue stenciling program	Continue partnership through financial contribution
PP 3	**Poster Contest/** ***John McMahon – DPW***	-		Develop and Pilot Contest in Grade 4	Modify and continue contest	Modify and continue contest
PP 4	**Organize public meetings and panels/** ***John McMahon – DPW***	Discussion of storm water at one public meeting and broadcast on cable	Discussed recently completed Rex Drive drainage improvement project which by improving catchment and flow capacity produced major reductions in flow across industrial area into the Farm River.	Discussion of storm water at one public meeting and broadcast on cable	Discussion of storm water at one public meeting and broadcast on cable	Discussion of storm water at one public meeting and broadcast on cable
PP 5	**Town Departments Involved/** ***John McMahon - DPW***	Involve departments in flier distribution and regulation	Highway Department distributed fliers	Continue to involve departments	Continue to involve departments	Continue to involve departments

3. Illicit Discharge Detection and Elimination

BMP ID#	Best Management Practice/*Responsible Dept. – Contact*	Measurable Goals				
		Year 2 (March 2004 to March 2005)	Annual Report Status	Year 3 (March 2005 to March 2006)	Year 4 March 2006 to March 2007)	Year 5 (March 2007 to March 2008)
ID 1	**Develop a comprehensive Storm Drain Map for the Town/** *John McMahon-DPW*	Determine Essential Fish Habitation Determine Historical Location Impacts	GPS location and map updating continued on schedule.		GPS locate 20% drainage system & outfalls Input existing plans to GIS map	GPS locate 20% drainage system & outfalls Update map with any drainage additions
ID 2	**Implement a Town Bylaw** */ Peter Lapolla - Planning/ConCom*	Hold Public Meeting to explain bylaw and rules and regulations Develop bylaw/ordinance with stated penalties governing illicit discharges	Since 2001 the Town has been under a Massachusetts Department of Environmental Protection Consent Order requiring the elimination of illegal storm water discharges to the Town's sewage system by either surface disposal or connection to the Town's storm drainage system. The Consent Order has been administered by the Town's Water and Sewer Division and a copy of said program is attached [Attachment A]. Recently Town Meeting enacted regulations prohibiting direct discharge of storm drainage and subsurface [basement] drainage to the Town's stormwater system [Attachment B]. Given these activities, the Town has determined that the development of additional ordinances or regulations is not warranted at this time.	Evaluate effectiveness of stormwater regulations, incorporate into new Town Ordinances.	Evaluate effectiveness of stormwater regulations and ordinances.	Review effectiveness of ordinances
ID 3	**Perform an illicit discharge detection campaign/** ***John McMahon - DPW***				-	-
ID 4	**Correct Illicit Discharges/** ***John McMahon - DPW***	Develop plan to remove illicit discharges if confirmed to be required at Common Street and Commercial Street areas.	Sewer hydraulics at the intersection of Commercial Street and Taber Court were modified to curtail surcharges to the river.	Remove illicit discharges if confirmed to be required in Common Street and Commercial Street areas.	Enforce By-Law	
ID 5	**Educate Citizens/** ***John McMahon - DPW***	Develop and distribute fliers defining illicit discharges and summarizing the Town By-Law	Distributed with water and sewer bills.	-	-	Re-distribute fliers

4. Construction Site Stormwater Runoff Control

BMP ID#	Best Management Practice/*Responsible Dept. – Contact*	Measurable Goals: Year 2	Annual Report Status	Year 3	Year 4	Year 5
CS 1	**Implement by-law related to construction runoff control/ *Peter Lapolla –Planning/ConCom***	Create Storm Water Committee Complete in-house assessment	The Departments of Conservation & Planning, Engineering, and Inspections, with applicant's engineering firms cooperated to upgrade the Town's erosion control regulations. These revised erosion control regulations were adopted as part of the wetland regulations by the Conservation Commission and incorporated into the Rules and Regulations Governing the Subdivision of Land by the Planning Board in 2002 and were enacted into the Zoning Bylaw in 2003. [See Attachment C]. See above	Review by-law and enhance if necessary	Review by-law and enhance if necessary	-
CS 2	**Incorporate sanctions into By-Law to ensure compliance/ *Peter Lapolla –Planning/ConCom***	Sanctions developed and included in by-law	Zoning Bylaw-To ensure compliance with the Bylaw, the Inspector of Buildings has the authority to issue a ticket [no criminal disposition], issue a daily fine and/or issue a "stop work order." Rules and regulations for subdivisions -To ensure compliance with the subdivision rules and regulations, Planning Board staff has the authority to issue "stop work orders" and to revoke subdivision approval. Wetland regulations-To ensure compliance with their regulations, the Conservation Commission has the authority to issue a ticket [non-criminal disposition], issue a daily fine and/or issue an enforcement order to stop all work.	-	Noticeable efforts made to ensure compliance	-
CS 3	**Site Plan Review/ *Peter Lapolla –Planning/ConCom***	All applicable plans reviewed for compliance with by-law	Said site plan reviews are conducted by the Planning Board [the Special Permit Granting Authority] through public hearing requiring notice to abutters, public notice and posting of the public notice The Zoning Bylaw requires that the Planning Board find that a proposed project will be in compliance with all the requirements set forth in the Zoning Bylaw, including Section 135-1203 Erosion Control Regs.	-	-	-
CS 4	**Site inspection and enforcement of control measures/ *Peter Lapolla –Planning/ConCom***	Standard site inspection Guidelines in place	The implementation and maintenance of erosion control measures are required for all projects where there will be ground disturbance. Typically we require the implementation of erosion control measures per plan prior to start of work, inspection of erosion control measures prior to start of work, on-going monitoring and maintenance by the applicant during construction. It is Department policy to conduct inspections prior to and at the start of construction. Visits continue on a periodic basis as needed.		Review inspection guidelines. Enhance if necessary.	Measurable decrease in violations since start of inspections.
CS 5	**Establish procedures to record and address public inquiries or concerns / *Peter Lapolla –Planning/ConCom***	-	The Department of Planning and Conservation established policies/procedures to address public concerns over all development activity in Town. When a call is received staff conducts a site visit to determine jurisdiction, the presence of a violation and the need for corrective action, if any. If an issue can be resolved immediately, staff issues a verbal order for corrective action and reports back to the person who raised concern. If staff determines the issues involved cannot be corrected immediately, work is stopped and the individual responsible for the activity is required to file a formal application. Any approval would require erosion control measures to be implemented. This process works well and changes are not recommended.	Review procedure and enhance if necessary.	-	-

5. Post-Construction Stormwater Management

in New Development and Redevelopment

BMP ID#	Best Management Practice/*Responsible Dept. – Contact*	Measurable Goals				
		Year 2	Annual Report Status	Year 3	Year 4	Year 5
PC 1	**Evaluate, enhance and implement zoning requirements / *Peter Lapolla –Planning/ConCom***	Evaluate current zoning by-laws and determine weaknesses related to surface water preservation	Section 135-609 of the Zoning Bylaw [Watershed Protection District] encompasses approximately 40% of the Town and includes four of the five lakes/ponds in town. Greater protection is afforded to the water bodies in the District by limiting the intensity of allowable development. A Department review of development practices in the Town indicated that surface water bodies were being threatened by uncontrolled grading activities. In 2003 Town Meeting approved adding an erosion control component to the Zoning Bylaw updated the section on grading. And the same regulations have been adopted into the Rules and Regulations for the Subdivision of Land and the Town's wetland regulations [Attachments C-3 and E].	Develop new zoning by-laws focused on surface water preservation	-	-
PC 2	**Develop regulations requiring specific structural storm water controls/ *Peter Lapolla –Planning/ConCom***	Identify specific structural controls (BMPs) in Subdivision Rules and Regulations	In 2002 the Planning Board revised its rules and regulations and as part of that revision required that all subdivisions be in compliance with the Stormwater Policy of the Department of Environmental Protection. Said Policy requires the removal of up to 80% TSS through the implementation of BMPs [Attachment F].	-	-	-
PC 3	**Develop review and inspection procedures for private storm water systems *Peter Lapolla –Planning/ConCom***	-		Review condition on maintenance requirements	Develop and implement an inspection procedure	-

6. Pollution Prevention and Good Housekeeping in Municipal Operations

BMP ID#	Best Management Practice/*Responsible Dept. – Contact*	Measurable Goals				
		Year 2	**Annual Report Status**	**Year 3**	**Year 4**	**Year 5**
GH 1	**Audit of Town Facilities/** ***John McMahon – DPW***	Assessment of DPW Yard	Removed rusted equipment from river edge, re-graded slope to eliminate erosive flow in favor of sheet flow.	Assessment of WWTP	Assessment of Filtration Plant	-
GH 2	**Operation and Maintenance Program/** ***John McMahon - DPW***	Monitor depth of sediment in ??? % of Town Catch-basins	Dispatched catchbasin cleaning crew every work day (except snow emergencies.)	Develop schedule for catch basin cleaning based on priority areas	-	-
GH 3	**Employee Training Programs/** ***John McMahon – DPW***	Organize employee trainung files	In addition to GH 1, worked on educating crews of importance of sander settings.	Administer a good housekeeping workshop at DPW	-	-
GH 4	**Recycling Program/** ***John McMahon - DPW***	Monitor recycling program and enhance if necessary	Continued monitoring recycling programs.	-	Monitor recycling program and enhance if necessary	-

Part IV. Summary of Information Collected and Analyzed

During investigations of outfalls, 35 were found to have dry weather flow. Each of these has been sampled at least once.

One location was found to exceed allowed limits of fecal coliform. Three were found to exceed 0.5 mg/l of ammonia-nitrogen. Three were found to have high conductance, suggesting high total dissolved solids.

Part V. Program Outputs & Accomplishments (OPTIONAL)

Programmatic

Stormwater management position created/staffed	(y/n)	N
Annual program budget/expenditures	($)	Not tracked

Education, Involvement, and Training

Estimated number of residents reached by education program(s)	(# or %)	1200
Stormwater management committee established	(y/n)	Not per se
Stream teams established or supported	(# or y/n)	Y
Shoreline clean-up participation or quantity of shoreline miles cleaned	(y/n or mi.)	0.5-1.0 mi.
Household Hazardous Waste Collection Days		
▪ days sponsored	(#)	1
▪ community participation	(%)	Small
▪ material collected	(tons or gal)	Unknown
School curricula implemented	(y/n)	N

Legal/Regulatory

	In Place Prior to Phase II	Under Review	Drafted	Adopted
Regulatory Mechanism Status (indicate with "**X**")				
▪ Illicit Discharge Detection & Elimination	X			
▪ Erosion & Sediment Control				X
▪ Post-Development Stormwater Management				X
Accompanying Regulation Status (indicate with "**X**")				
▪ Illicit Discharge Detection & Elimination	x			
▪ Erosion & Sediment Control				X
▪ Post-Development Stormwater Management				X

Mapping and Illicit Discharges

Outfall mapping complete	(%)	About 80%
Estimated or actual number of outfalls	(#)	247+
System-Wide mapping complete	(%)	80
Mapping method(s)		
▪ Paper/Mylar	(%)	80
▪ CADD	(%)	80
▪ GIS	(%)	80
Outfalls inspected/screened	(# or %)	227
Illicit discharges identified	(#)	7
Illicit connections removed	(#) (est. gpd)	
% of population on sewer	(%)	99
% of population on septic systems	(%)	1

Construction

Number of construction starts (>1-acre)	(#)	2
Estimated percentage of construction starts adequately regulated for erosion and sediment control	(%)	100
Site inspections completed	(# or %)	100%
Tickets/Stop work orders issued	(# or %)	2
Fines collected	(# and $)	0
Complaints/concerns received from public	(#)	20-30

Post-Development Stormwater Management

Estimated percentage of development/redevelopment projects adequately regulated for post-construction stormwater control	(%)	100
Site inspections completed	(# or %)	100%
Estimated volume of stormwater recharged	(gpy)	Not tracked

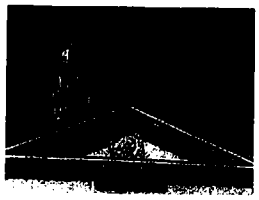
Operations and Maintenance

Average frequency of catch basin cleaning (non-commercial/non-arterial streets)	(times/yr)	1
Average frequency of catch basin cleaning (commercial/arterial or other critical streets)	(times/yr)	1
Total number of structures cleaned	(#)	
Storm drain cleaned	(LF or mi.)	
Qty. of screenings/debris removed from storm sewer infrastructure	(lbs. or tons)	
Disposal or use of sweepings (landfill, POTW, compost, recycle for sand, beneficial use, etc.)		
Cost of screenings disposal	($)	

Average frequency of street sweeping (non-commercial/non-arterial streets)	(times/yr)	1
Average frequency of street sweeping (commercial/arterial or other critical streets)	(times/yr)	1
Qty. of sand/debris collected by sweeping	(lbs. or tons)	
Disposal of sweepings (landfill, POTW, compost, beneficial use, etc.)	(location)	
Cost of sweepings disposal	($)	
Vacuum street sweepers purchased/leased	(#)	1
Vacuum street sweepers specified in contracts	(y/n)	0

Reduction in application on public land of: ("N/A" = never used; "100%" = elimination)		
▪ Fertilizers	(lbs. or %)	2%
▪ Herbicides	(lbs. or %)	N/A
▪ Pesticides	(lbs. or %)	N/A

Anti-/De-Icing products and ratios	% NaCl % $CaCl_2$ % $MgCl_2$ % CMA % Kac % KCl % Sand	
Pre-wetting techniques utilized	(y/n)	N
Manual control spreaders used	(y/n)	Y
Automatic or Zero-velocity spreaders used	(y/n)	Y
Estimated net reduction in typical year salt application	(lbs. or %)	Weather dep.
Salt pile(s) covered in storage shed(s)	(y/n)	Y



TOWN OF BRAINTREE

Department of Planning and Conservation

TO: Robert Campbell, Town Engineer

FROM: Peter S. Lapolla, Director of Planning and Conservation

DATE: December 26, 2006

RE: Review of Activities in Support of the Town's Stormwater Phase II Permit

Staff has reviewed the Implementation Plan submitted by the Town in support of the Town's Stormwater Phase II Permit and provides the following summary of the activities the Department has undertaken in implementing the plan:

Table 2.1 Public Education and Outreach

1) Form partnership with one organization

a) The Fore River Watershed Association was created in the mid-1990s through a Massachusetts Bays Embayment Grant awarded to Braintree, Weymouth and Quincy. Since the creation of the Association, the Department of Planning and Conservation has maintained an on-going relationship by participation in specific projects. Since 2003, the Department has worked with the Association in staffing a river monitoring station located in the Monatiquot River and in approaching the Division of Marine Fisheries regarding re-establishing a herring run in the Monatiquot River. The Department will continue to partner with the Association on a project-by-project basis as opportunities arise.

b) Weymouth-Braintree Regional Recreation-Conservation District [Pond Meadow]

Pond Meadow is a regional conservation area in Braintree and Weymouth with whom the Department of Planning and Conservation has partnered on a project-by project basis. Most recently, the Department helped secure funding to address an on-going weed problem in the Pond at Pond Meadow and to secure funding to expand Pond Meadow's trail system.

2) Classroom instruction

The Department of Planning and Conservation has scheduled to develop a storm water education program for Pond Meadow's summer camp and plans to implement the program in Summer 2007.

90 Pond Street
Braintree, Massachusetts 02184-6498
Phone 781.794.8230, Fax 781.794.8089
townofbraintreegov.org/planning

Table 3.1 Public Participation/Involvement

Form partnership with local organization [Watershed or Boy/Girl Scout]

a) In addition to the partnerships noted in 2.1, the Department of Planning and Conservation has had an on-going relationship with the Braintree Eagle Scout Program which continues on a project-by-project basis. In the past the Department has worked with the Eagle Scouts to maintain a trail system in the Town's Cranberry Pond Area of Critical Environmental Concern.

b) Town Engineer and the Town Forest committee partnered with the Eagle Scouts to rehabilitate a small dam in Town Forest that had fallen into disrepair.

c) The Department of Planning and Conservation secured funding from the Conservation Commission for a stenciling program and has discussed with Eagle Scout leaders the possibility of implementing said program in 2007.

Table 4.1 Illicit Discharge Detection and Elimination

Implement a Town Bylaw

Since 2001 the Town has been under a Massachusetts Department of Environmental Protection Consent Order requiring the elimination of illegal storm water discharges to the Town's sewage system by either surface disposal or connection to the Town's storm drainage system. The Consent Order has been administered by the Town's Water and Sewer Division and a copy of said program is attached [Attachment A]. Recently Town Meeting enacted regulations prohibiting direct discharge of storm drainage and subsurface [basement] drainage to the Town's stormwater system [Attachment B].

Given these activities, the Town has determined that the development of additional ordinances or regulations is not warranted at this time.

Table 5.1 Construction Site Runoff Control

1) Implement Bylaw related to construction runoff

From 2000 to 2003, the Department worked with staff from the Departments of Engineering and Inspections, as well as with engineering firms who appear before either the Planning Board or Conservation Commission, to upgrade the Town's erosion control regulations. New regulations were drafted and presented to appropriate Town bodies for adoption. These revised erosion control regulations were adopted as part of the wetland regulations by the Conservation Commission and incorporated into the Rules and Regulations Governing the Subdivision of Land by the Planning Board in 2002 and were enacted into the Zoning Bylaw in 2003. Since adoption, the erosion control

regulations are applied to all applications for development submitted to the Planning Board and Conservation Commission [Attachment C].

2) Incorporate sanctions into Bylaw to ensure compliance

a) Zoning Bylaw
To ensure compliance with the Bylaw, the Inspector of Buildings has the authority to issue a ticket [no criminal disposition], issue a daily fine and/or issue a "stop work order."

b) Rules and regulations for subdivisions
To ensure compliance with the subdivision rules and regulations, Planning Board staff has the authority to issue "stop work orders" and to revoke subdivision approval.

c) Wetland regulations
To ensure compliance with their regulations, the Conservation Commission has the authority to issue a ticket [non-criminal disposition], issue a daily fine and/or issue an enforcement order to stop all work.

3) Site Plan Review

Section 135-711 of the Zoning Bylaw requires a site plan review prior to the issuance of a building permit for all special permits, for all multi-family or apartment developments and for all developments where the area of any new structure or extension of an existing structure is 500 SF or more, excluding single- and two-family homes and related accessory structures which are not subject to special permit.

Said site plan reviews are conducted by the Planning Board [the Special Permit Granting Authority] through public hearing requiring notice to abutters, public notice and posting of the public notice The Zoning Bylaw requires that the Planning Board find that a proposed project will be in compliance with all the requirements set forth in the Zoning Bylaw, including Section 135-1203 Erosion Control Regulations.

4) Site inspection and enforcement of control measures

a) All applications approved by the Planning Board and/or the Conservation Commission include conditions governing site activities during construction. The implementation and maintenance of erosion control measures are required for all projects where there will be ground disturbance.

Typically conditions of approval require the implementation of erosion control measures as per plan prior to start of work, inspection of erosion control measures prior to start of work, on-going monitoring and maintenance by the applicant of the erosion control measures during construction and the ability of the Department of Planning and Conservation to require corrective action [Attachment D].

b) In addition to conditions that govern erosion control, all approvals allow Department of Planning and Conservation staff to conduct site inspections and it is Department policy to conduct such inspection prior to *and at* the start of construction to ensure erosion control. Said visits continue on a periodic basis as needed to ensure compliance with the plan and conditions of approval.

5) Establish procedures to record and address public inquiries or concerns

Prior to implementation of the current stormwater permit requirements, the Department of Planning and Conservation established policies/procedures to address public concerns over all development activity in Town. When a call is received staff conducts a site visit to determine jurisdiction, the presence of a violation and the need for corrective action, if any. If an issue can be resolved immediately, staff issues a verbal order for corrective action and reports back to the person who raised concern. If staff determines the issues involved cannot be corrected immediately, work is stopped and the individual responsible for the activity is required to file a formal application. Any approval would require erosion control measures to be implemented.

The Department has determined that this process works well and has not recommended changes.

Table 6.1 Post-Construction Runoff Control

1) Evaluate, enhance and implement zoning requirements

a) Since 1980 the Town has protected its surface drinking water supply through Section 135-609 of the Zoning Bylaw [Watershed Protection District]. This District encompasses approximately 40% of the Town and includes four of the five lakes/ponds in town. Greater protection is afforded to the water bodies in the District by limiting the intensity of allowable development.

b) A Department review of development practices in the Town indicated that surface water bodies were being threatened by uncontrolled grading activities. In 2003 Town Meeting approved adding an erosion control component to the Zoning Bylaw updated the section on grading. And the same regulations have been adopted into the Rules and Regulations for the Subdivision of Land and the Town's wetland regulations [Attachments C-3 and E].

2) Develop regulations requiring specific structural storm water controls

In 2002 the Planning Board revised its rules and regulations and as part of that revision required that all subdivisions be in compliance with the Stormwater Policy of the Department of Environmental Protection. Said Policy requires the removal of up to 80% TSS through the implementation of BMPs [Attachment F].

3) Develop review and inspection procedures for private storm water systems

In any approval issued the Conservation Commission and Planning Board have included a condition requiring maintenance of any storm water system installed under that approval. Said condition has always included that a record of said maintenance be kept and available for inspection by staff of the Department of Planning and Conservation.

Since promulgation of the Stormwater Policy by the Department of Environmental Protection, both the Planning Board and Conservation Commission include a maintenance plan as a condition of approval for any project which includes stormwater structures. Such maintenance plan includes the training necessary to perform each task and the individual assigned to each and must

- identify all control measures that will be inspected and maintained,
- provide an inspection schedule and typical maintenance procedures for each control measure,
- describe steps for necessary repair, and
- provide instructions and forms for record keeping.

Attachment A

TOWN OF BRAINTREE
MASSACHUSETTS

DEPARTMENT OF PUBLIC WORKS
WATER AND SEWER DEPARTMENT

ADMINISTRATIVE CONSENT ORDER

ACO-NE-01-1001

QUARTERLY REPORT

OCTOBER 2006

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT
90 Pond Street
Braintree, Massachusetts 02184-5337
Office: (781) 843-8097
Fax: (781) 843-8285

Thomas Whalen, Director
Department of Public Works

Ben Fehan, Senior Engineer
Water & Sewer Department

Kathryn Clements
Office Manager

October 31, 2006

Mr. Eric Worrall
Deputy Regional Director
Bureau of Resource Protection
DEP- Northeast Regional Office
205B Lowell Street
Wilmington, MA 01887

RE: Town of Braintree
Administrative Consent Order
ACO-NE-01-1001, Paragraph 27

Dear Mr. Worrall

In accordance with the terms of our Consent Order, we submit for your review and approval the attached "Quarterly Report" for the period ending October 31, 2006.

Some of the key events this Quarter include:

- We have 7 sewage flow meters, at strategic locations, for year round monitoring.
- We continue to remove sump pumps from the sewer system.
- We continue to manage a grease treatment program.

We continue to pursue those activities which will complete the Consent Order as expeditiously as possible.

Please call if you have any questions.
Very truly yours

Ben Fehan
Senior Engineer

Cc: Charles Ryan, Chairman Board of Selectmen
Sue Kay Interim Executive Secretary

ADMINISTRATIVE CONSENT ORDER

ACO-NE-01-1001

QUARTERLY REPORT

(July 1, 2006 thru September 30, 2006)

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Contracts 9 & 10.

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Section M - Metering

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

STATUS SUMMARY

(July 1, 2006 thru September 30, 2006)

A summary of the status of all the Consent Order Items follows:

SECTION A

TOWN OF BRAINTREE

ACO-NE-01-1001

STATUS SUMMARY

9/30/2006

PAR.	DESCRIPTION	START DATE	DUE DATE	EST. COMP. DATE	PROJ. TYPE	STATUS
31	Annual Flow Monitoring	3/01/2001	11/16/2001		Study	Complete
35a	Public Building I/I	3/01/2001	2/01/2002		Study	Complete
35b	Private Sewer I/I	3/01/2001	2/01/2002		Study	Complete
35c	Public/Private I/I Report	10/01/2001	2/01/2002		Report	Complete
36a	Private Inflow List	3/01/2001	5/30/2001		Study	Complete
36b	Sump Pump Redirection	6/01/2000	12/14/2001	ongoing	Const.	On-going
37a	HC2 & M2 Inflow Source	6/01/2000	5/03/2001		Study	Complete
37b	HC2 & M2 Redirection	6/01/2000	10/05/2001		Const.	Complete
38a	HC-1 I/I Study	3/01/2001	11/15/2001		Study	Complete
38b	HC-1 Inflow Reduction	3/01/2002	7/1/2002		Const.	Complete
39	Inflow Reductions	ongoing	ongoing	ongoing	Const.	Initial phase complete
40	Surrey Lane P. S.	6/01/2000	6/29/2001		Const.	Complete
41	Union St. P.S.	2/01/2001	7/1/2002		Const.	Complete
42	Common St. P.S.	6/01/2000	2/1/2002		Const.	Complete
43a	Allen St. Siphon	7/01/2001	2/1/2002		Const.	Complete
43b	HC-2 & M-2 I/I Rehab.	6/01/2000	2/1/2002		Const.	Complete
44a	RJV 41 Services	6/01/2000	2/1/2002		Const.	Complete
44b	MWRA TV Repairs-Ph1	6/01/2000	2/1/2002		Const.	Complete
45a	MWRA TV-Ph2	3/01/2001	10/30/2001		Study	Complete
45b	MWRA TV Repairs-Ph2	11/01/2001	10/20/2002		Const.	Complete
46a	Union St. Underdrain	2/01/2001	12/14/2001		Study	Complete
46b	Howie Rd. I/I	3/01/2002	7/02/2002	Dec. 2006	Const.	Construction ongoing
46c	Arnold St. Siphon	3/01/2001	12/14/2001		Study	Complete
46d	Allen St-Howard St Int I/I	3/01/2001	12/14/2001		Study	Complete
47	Union St/Arnold St Hyd.	12/14/2001	3/01/2002		Study	Complete
48	Howard St P.S.	2/01/2001	5/21/2002		Const.	Complete
49	HC-1 I/I Const.	11/15/2001	7/1/2002		Const.	Complete
50	Infilt. Reduc Work	ongoing	ongoing	ongoing	Const.	On-going
51	Public Education	6/01/2000	8/31/2001	ongoing	Study	On-going
52	Draft O& M Manual	3/01/2000	3/29/2002		Operations	Complete
53	Revised O&M Manual Act.	4/01/2001	3/29/2002		Report	Complete
54	Rev. O & M Budget Plan	4/01/2001	3/29/2002		Report	Complete
55	Union St. Int. Cleaning	4/01/2001	5/01/2001		Const.	Complete
56	Sampling of Underdrains	7/01/2001	11/16/2001		Study	Complete
56	Sampling of Storm Drains	7/01/2001	11/16/2001		Study	Complete
57	Cross-connection Report	7/01/2001	12/14/2001		Study	Complete
58	Stormwater Control Bylaws	7/01/2001	11/01/2001		Study	Complete
60	Interdepartmental-Storm Dr	3/27/2001	4/30/2002		Operations	Complete
60	Interdepartmental-Paving	3/27/2001	4/30/2002		Operations	Complete

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

ACO COMPLIANCE

(July 1, 2006 thru September 30, 2006)

We continue to comply with the letter and the spirit of the Consent Order.

A Consent Order review meeting was held on September 20, 2004 at the Boston office of the DEP. At that meeting, we requested a number of items and the DEP has not responded to date.

As further evidence of compliance we:

Continue to conduct the sump pump redirect program even though the original mandated list has been addressed.

Have implemented a new metering program to help us identify the area of greatest I/I issues.

We have begun the process of implementing a SCADA Program to allow for better monitoring of the Town's facilities.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

I/I INITIATIVES

(April 1, 2006 thru June 30, 2006)

During the month of March, we conducted an intense investigation of the homes on Barstow Drive and Hingston Circle that are connected to the Farm River Pump Station. During the 5 inch rain fall we received on October 15, 2005, the station was overwhelmed by the quantity of sewage it received.

Our investigation included an inspection of each house and the televising of the sewer service from the house to the main. We expected to find either illegal sump pump connections or a house under-drain system. Our investigation failed to uncover the source of the extraneous flows.

During the three storm events in the last quarter we continued our investigation of this area with better results. We were able to observe a number of I/I sources in and around the manholes.

During this quarter, we had a change order prepared for the Contractor working on the Howie Road project to rehabilitate this sewer system. The work should be done during the next quarter.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

GREASE CONTROL

(July 1, 2006 thru September 30, 2006)

Our aggressive grease treatment program is ongoing.

We continue to operate and maintain eight grease treatment units in public facilities throughout the town. Also, since this contract is ending we are preparing to bid a new yet similar contract.

We are also requiring restaurants that change ownership to install the treatment systems. All large restaurants were to have the treatment devices by June 2006.

Although we have not started to check on the compliance with the June 30th regulation, we know from phone calls and other conversations that there are many food establishments that have installed the grease treatment to date.

The annual Town Meeting held in May 2006 voted a $100/day fine for all establishments that do not comply with the grease requirements.

The Director of Public Works has also had a contract prepared which will allow the Town to install grease treatment in restaurants and then recover the cost in the water & sewer bill. This should be out to bid soon.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SEWER OVERFLOW INCIDENTS

(July 1, 2006 thru September 30, 2006)

There were no overflow events during this reporting period.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

INTERDEPARTMENTAL COORDINATION REPORTS

(July 1, 2006 thru September 30, 2006)

The weekly DPW meetings continued through this quarter. These coordination meetings have improved the cooperation between departments and provide a forum for the coordination envisioned by the framers of the Consent Order.

The meetings are usually held on Wed. morning under the chairmanship of Tom Whalen, Director of Public Works.

Since we have moved to our new offices at 90 Pond Street we are now in the same building with the Engineering Department and this has further improved interdepartmental cooperation.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SUMP PUMP REDIRECT PROGRAM SUMMARY

(As of September 30, 2006)

To date, we have redirected the sump pumps in 344 houses and 367 sump pumps have been redirected.

A complete summary of this program is attached.

SUMMARY OF SUMP PUMP REDIRECT PROGRAM

(as of 6/30/06)

CONT. NO.	CONTRACTOR	FOR	BID DATE	COMP. DATE	NO. OF HOMES	PUMPS REMOVED	FINAL COST
HOUSES COMPLETED INDEPENDANTLY BY DEVELOPERS							
	The Flatley Company	The Flatley Company	----	----	11	11	----
	Poulos Const. Co.	Poulos Const. Co.	----	----	15	15	----
	Solimini Corp.	Solimini Corp.	----	----	8	8	----
	Mento Landscaping	Mento Landscaping	----	----	1	1	----
CONTRACTS ASSEMBLED & AWARDED							
1	P. Benedict & Sons	Town	3/7/2002	7/19/2002	32	33	$67,319
2	P. Benedict & Sons	Town	6/5/2002	11/8/2002	36	45	$70,853
3	R. Pompeo	Quirk Motors	----	10/24/2002	15	16	----
4	P. Benedict & Sons	Town	10/10/2002	6/11/2003	32	34	$73,620
5	P. Benedict & Sons	Commerce Park Housing Assoc.	----	9/30/2003	46	50	----
6	P. Benedict & Sons	Bregoli Subdivision	----	6/15/05	6	6	----
7	P. Benedict & Sons	Town	8/21/2003	8/16/2004	35	38	$80,792
8	P. Benedict & Sons	Town	8/12/2004	12/12/2005	50	56	$128,082
9	P. Benedict & Sons	Under construction	7/28/2005	**	53	53	(***)
10		Out to Bid	10/19/2005		1	1	
11		Under design			3	0	
		TOTAL TO DATE			344	367	

(*) Constr. not started.
(**) Under constr.
(***) Bid price - $117,585

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SUMP PUMP REDIRECT PROGRAM

CONTRACT 9

(as of September 30, 2006)

Work on this project was continued during this reporting period. The contract may contain up to 58 houses.

The Contractor is Benedict & Sons of Rockland, MA.

53 houses have been completed to date.

See attached info sheets on this contract.

Work is slow as always at the end of a contract since we are down to the slow responders

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SUMP PUMP REDIRECT PROGRAM

CONTRACT 10

(as of September 30, 2006)

The design of redirects for Contract 10 was started last quarter.

However, we have discovered one house that contributes a lot of water to the sewer system. The house was constructed in a ledge area and there is no readily available disposal point for the water. Therefore, we have decided to bid the work to redirect this house as a separate contract.

The house is located at 39 Geraldine Road. It will take about 1,100 feet of 4" PVC pipe to redirect this sump pump to a catch basin.

The cost estimate is $25,000 and the bid opening date will be October 19, 2006.

The other homes that were previously targeted for Contract 10 will be in contract 11.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SEWER FLUSHING REPORTS

(July1, 2006 thru September 30, 2006)

During this reporting period, the flushing program was continued. The flushing activities are recorded and the flushing record sheets are available upon request.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

PROPOSED WORK PERMIT REVIEWS

(July 1, 2006 thru September 30, 2006)

Our department reviewed a total of 37 proposed construction projects during this quarter.

The review was to determine if the proposed work impacted the DEP guidelines regarding the maintenance of the Sewer Bank.

Of the 37 projects reviewed 17 projects were identified as impacting the sewer bank.

The Title 5 flow from the 17 projects amounted to 4,734 GPD.

The fees we collected for these permits amounts to $26,436.

A summary of the permits reviewed this quarter is attached.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

Sheet 31 of

PROPOSED WORK PERMIT REVIEW

NO	DATE	STREET	PERMIT NOT REQ.	PERMIT REQUIRED	TITLE V (GPD)	FEES	COMMENTS
1377	9/13/06	1515 Washington St.	X				Freeman Dec-remodel
1378	9/14/06	396 Washington St.	X				Store repair
1379	9/15/06	220 Wood Rd.	X				Office conv. to retail
1380	9/15/06	51 Liberty Park Ave.		X	110	$440	1 bedroom addition
1381	9/15/06	250 Granite St.-Macy's	X				Remodel shoe depart.
1382	9/18/06	90 Fallon Circle	X				Garage extension
1383	9/20/06	333 Commerce Park Dr.		X	110	$440	Conn P.O. to sewer
1384	9/26/06	910 Washington St.	X				Remodel store
1385	9/26/06	415 Liberty St.		X	330	$1,320	3 bedroom addition
1386	9/26/06	2106 Washington St.	X				House remodel
1387	9/27/06	8 Cardinal Ct.	X				Remodel 3 Season R
1388	9/27/06	19 - 23 Granite St.	X				2nd fl Infosys
1389	9/27/06	37 Inglewood St.	X				Add family/kitchen rm
1390	9/29/06	401 Plain St.		X	110	$440	1 bedroom addition
		TOTAL THIS SHEET	**10**	**4**	**660**	**$2,640**	
		TOTAL SHEET 30	**27**	**13**	**4,074**	**$23,796**	
		TOTAL BOTH SHEETS	**37**	**17**	**4,734**	**$26,436**	

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

Sheet 30 of

PROPOSED WORK PERMIT REVIEW

NO	DATE	STREET	PERMIT NOT REQ.	PERMIT REQUIRED	TITLE V (GPD)	FEES	COMMENTS
1337	7/5/06	70R Howard St.		X	330	$1,320	New 3 Bedroom hse
1338	7/5/06	412 Pearl St.	X				Remodel kitchen
1339	7/5/06	464 Quincy Ave.	X				Demo-Ashmont Disc.
1340	7/5/06	75 Tenney Rd.	X				Kitchen & fam room
1341	7/6/06	54 Conrad St.	X				Living Room
1342	7/6/06	14 Cedar St.	X				Expand kitchen
1343	7/6/06	258 Jefferson St.	X				Family Room
1344	7/7/06	149 Hancock Ave.	X				Nail Salon
1345	7/7/06	31 Park Ave.	X				Family Room
1346	7/7/06	420 Washington St.	X				Remodel dentist office
1347	7/7/06	555 Pond St.		X	1662	$14,148	Duncan Donuts
1348	7/10/06	29 Sheppard Rd.		X	110	$440	1 bedroom addition
1349	7/11/06	111 Peach St.(Candle-)	X				Replacement hse
1350	7/19/06	632 Washington St G5	X				Finish basement
1351	7/19/06	14 Richard Rd.		X	110	$440	1 bedroom addition
1352	7/20/06	71 Adams St.	X				Storage loft
1353	7/21/06	40 Strathmore Circle		X	110	$440	1 bedroom addition
1354	7/24/06	46 Selwyn Rd.	X				Finish basement
1355	7/25/06	16 Strathmore Circle	X				Remodel house
1356	7/26/06	98 Storrs Ave.		X	42	$168	Glass Shop
1357	7/28/06	6 Columbian St.		X	500	$2,000	School addition
1358	7/31/06	340 Wood Rd.	X				Renovate Offices
1359	7/31/06	21 Harbor Villa Ave.	X				Finish basement
1360	8/7/06	59 Celia Rd.	X				Remodel house
1361	8/8/06	19 Cavanaugh Rd.	X				Full shed dormer
1362	8/8/06	1501 Washington St.	X				Office remodel
1363	8/9/06	50 Park Ave.		X	110	$440	1 bedroom addition
1364	8/21/06	55 Wilmarth Rd.		X	110	$440	1 bedroom addition
1365	8/21/06	40 Nelson St.		X	110	$440	1 bedroom addition
1366	8/25/06	139 Howard St.	X				Farmer's Porch
1367	8/28/06	12 Court Rd.		X	220	$880	2 bedroom addition
1368	8/29/06	100 Grandview Rd.	X				Office build-out
1369	8/29/06	15 Rockdale St.	X				Bldg. remodel
1370	8/30/06	250 Granite St.	X				Sarku @ Plaza
1371	8/31/06	268 Quincy Ave.	X				Office renovations
1372	8/31/06	242 Hayward St.	X				repair burnt house
1373	9/1/06	250 Granite St.-On the R	X				Plaza side remodel
1374	9/5/06	29 Leahaven Terrace		X	110	$440	1 bedroom addition
1375	9/8/06	1 Federal Drive	X				Wood storage mezza.
1376	9/12/06	29-39 Hayward St.		X	550	$2,200	New 5 bedrm duplex
		TOTAL THIS SHEET	**27**	**13**	**4,074**	**$23,796**	

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SEWER FLUSHING REPORTS

(July1, 2006 thru September 30, 2006)

During this reporting period, the flushing program was continued. The flushing activities are recorded and the flushing record sheets are available upon request.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

PUBLIC EDUCATION

(July 1, 2006 thru September 30, 2006)

During this reporting period, we were in the planning phase of our public education. We have hired Media Reps to coordinate the publicity program and they have been working on ads for the next quarter.

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SEWER MAINTENANCE

(July 1, 2006 thru September 30, 2006)

During this reporting period, the sewer maintenance program progressed on many fronts. The following are a few of the major actions undertaken through the efforts of our staff.

1. *The grease control program contract is ongoing. See Section D of this report.*

2. *Our crews continued their daily visits to all pump stations.*

3. *We continued to expend funds for system maintenance. A record of maintenance expenditures is available upon request.*

4. *Our flushing program continues. See Section H for details.*

5. *Recent equipment purchases include:*

   We purchased and received 3 new 4" centrifugal pumps.

   We received delivery of a new Hydraulic excavator

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SEWER BANK SUMMARY

(July 1, 2006 thru September 30, 2006)

Overall we still have a comfortable balance in the Sewer Bank. When looking at the bank by sub-area the balance in the Southeast district is low. That district has the newer sewers in town and the most undeveloped land. Those two factors led to the reduction in the balance there.

We look at the bank from an overall perspective since the overflows are caused by excess flows from all parts of town and they manifest themselves by overflowing at Allen St. in East Braintree.

Also, note that we have not recognized the flows from Sump Pump Contract 9 as yet since that contract has not been completed. We have also not received the credits for the Howie Road project since that is also still in the construction mode.

Extracts from our Sewer Bank tracking are attached.

SEWER BANK STATUS SUMMARY

AS OF SEPT. 30, 2006

	Initial Flow	Flow Issued	Applied Credit	Flow Remaining
North	10,000	103,592	156,108	62,516
South	1,060	46,053	75,466	30,473
Southeast	9,000	93,434	81,683	-2,751
Northeast	4,000	18,325	29,290	14,965
Sub-Areas TOTAL	24,060	261,404	342,548	105,204
Septic Conversion	20,000	14,665		5,335
TOTALS	44,060			**110,539**
Septic Reserve	**2,200**			
Grand Total	46,260			**112,739**

TOWN OF BRAINTREE

WATER & SEWER DEPARTMENT

SEWAGE FLOW METERING

(July 1, 2006 thru September 30, 2006)

The sewage flow meters were installed by ADS Environmental Services in April 2005. The location of the seven flow meters was reported in a previous quarter.

The meters continue to operate and record the flows. They are still downloaded and reported on by ADS Environmental even though the goal is to ultimately have them maintained and downloaded by our staff.

We attach a copy of the report for one of the meters for your information.

The meter sample attached is from the meter at Cross Street in Braintree Highlands.

We plan to add two or three more meters in the coming months.

ADS ENVIRONMENTAL SERVICES®

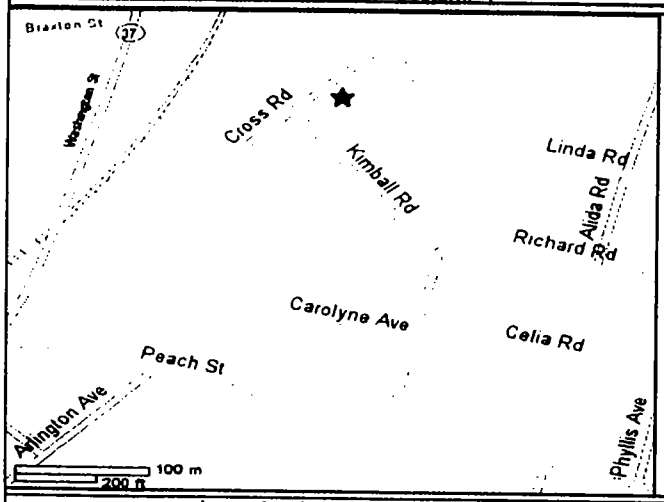
a division of ADS Corporation

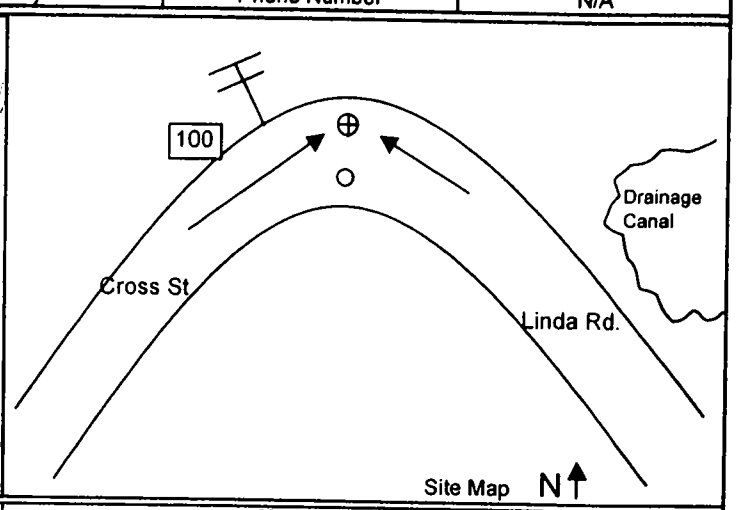
Site Report

FM Initials: MEJ

Project Name: Braintree

Site Name:	Braintree_FR1	Monitor Series	4000 WR	Monitor S/N:	1358	Manhole #	
Address / Location:	100 Cross St. @ Linda Rd.						
Access:	Drive	Type of System:	Sanitary	Pipe Height:		8 Inches	
				Pipe Width:		8.00"	
				Phone Number		N/A	





Investigation Information

Date/Time of Investigation:	April 6, 2005		
Site Hydraulics:	Very clear flow - D/S install		
Upstream Input: (L/S, P/S)			
Upstream Manhole:	N/A		
Downstream Manhole:			
Depth of Flow (Wet Dof):	3	+/-	0.25
Range (Air Dof):	3	+/-	0.25
Peak Velocity:	2.01	fps	
Silt:	0	Inches	

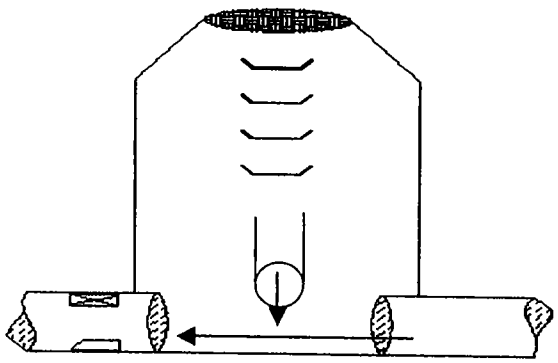
Manhole Information

Manhole Depth:	10 Feet	
Manhole Material / Condition		Fair
Active Drop Connections?		
Pipe Material / Condition:	Vetrified Clay Pipe	Fair
Mini System Character:	Residential	

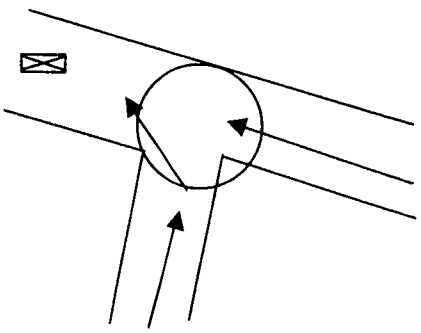
Telephone Information

Access Pole #:	N/A
Distance From Manhole:	N/A Feet
Road Cut Length:	N/A Feet
Trench Length:	N/A Feet

Other Information:



Cross Section



Planar N

Installation Information

Installation Type:	Doppler Special Installation
Sensors / Devices:	Ultra, Velocity, Pressure (I.S.)
Surcharge Height:	
Rain Gauge Zone:	

Backup	Yes	No	?	Distance
Trunk				
Lift/Pump Station				
WWTP				
Other				

Additional Site Information / Comments:

Reverse ring installation

SCATTERGRAPH REPORT

Braintree_FR1

Flow Monitor

Braintree_FR1

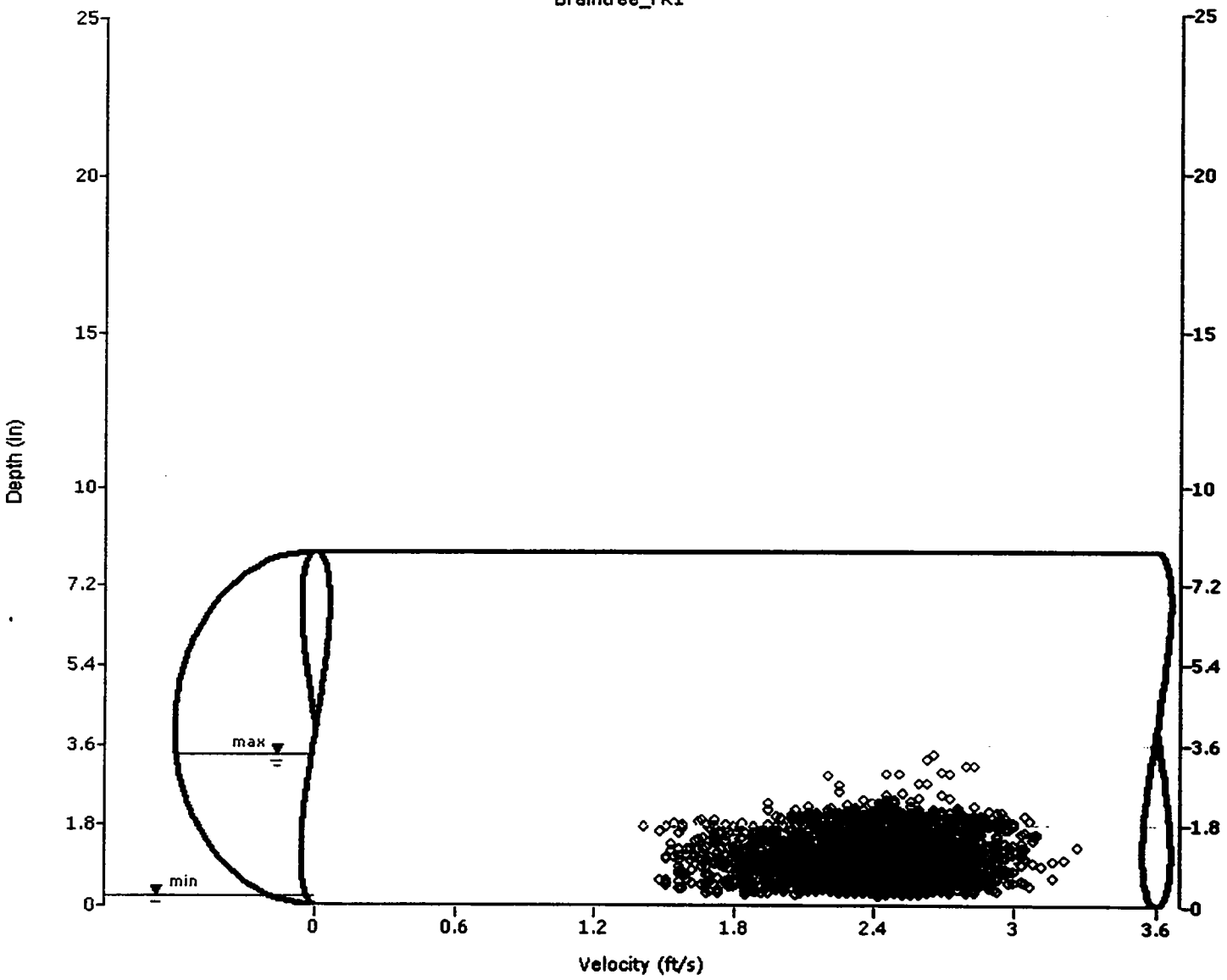
Nominal Diameter
8-in

Report Period

9/1/2006
To
9/30/2006

Legend

- Depth - Velocity
- Min-Max Depth



ADS ENVIRONMENTAL SERVICES

HYDROGRAPH REPORT

Braintree_FR1

Flow Monitor

Braintree_FR1

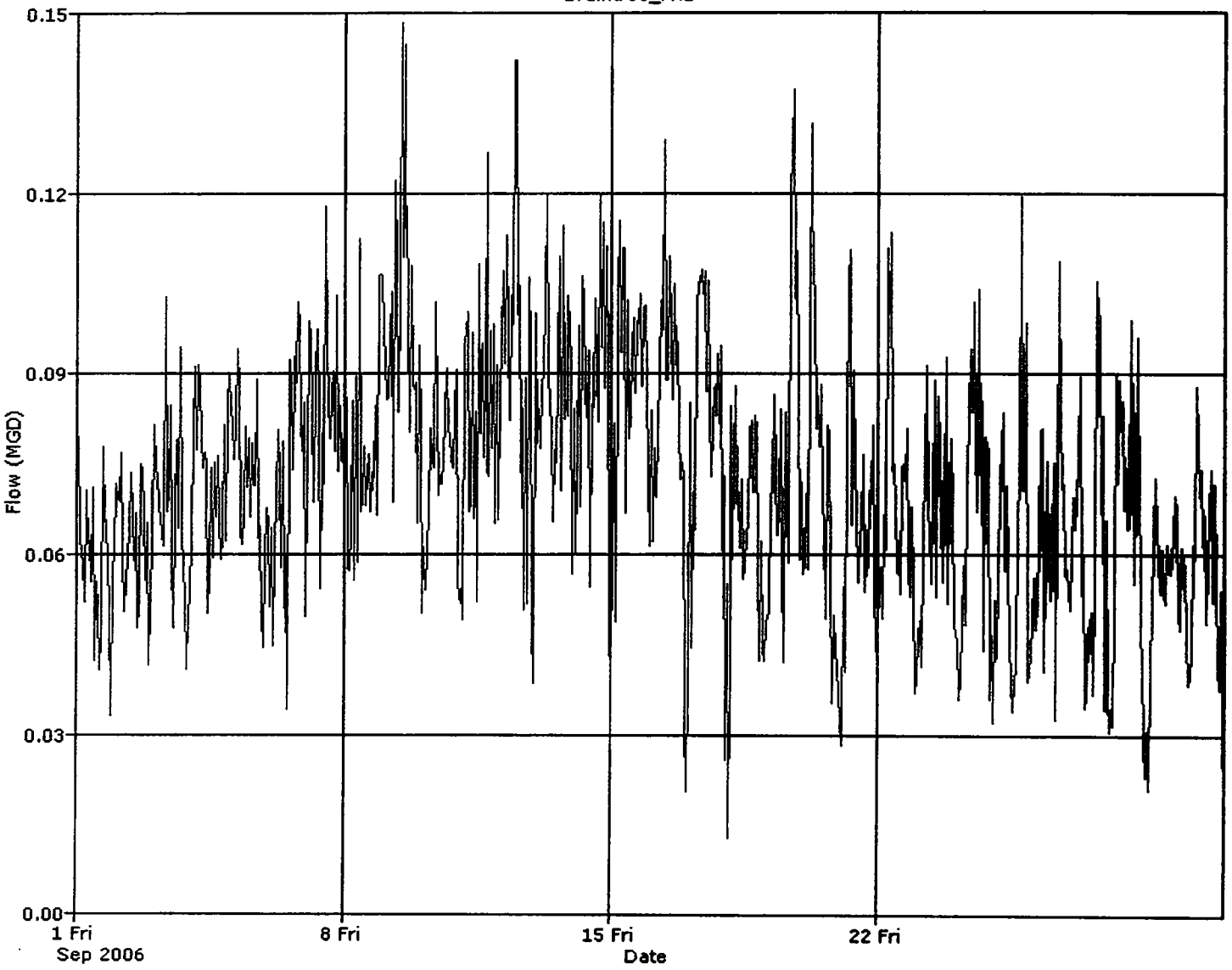
Nominal Diameter
8-in.

Report Period

9/1/2006
To
9/30/2006

Legend

Quantity



ADS ENVIRONMENTAL SERVICES

Daily Tabular Report For The Period 9/1/2006 - 9/30/2006

Braintree_FR1, Pipe Height: 8"

100 Cross St | Braintree MA | Interseotion of Cross St @ Linda Rd

Daily Tabular Report

Depth (in) Velocity (ft/s) Quantity (MGD - Total MG) Rain (in)

Date	Depth					Velocity					Quantity					
	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Time	Min	Time	Max	Avg	Total
9/1/2006	04:00	0.24	19:45	1.61	0.83	00:00	2.17	10:00	3.06	2.66	00:00	0.024	17:15	0.101	0.057	0.057
9/2/2006	01:45	0.22	16:15	2.13	1.00	00:30	2.00	22:30	3.03	2.45	14:15	0.017	16:15	0.117	0.062	0.062
9/3/2006	23:30	0.31	09:15	1.86	0.89	00:45	2.36	09:00	3.16	2.73	23:00	0.026	17:45	0.121	0.067	0.067
9/4/2006	04:15	0.23	20:45	1.91	0.81	23:15	2.24	09:30	3.08	2.65	17:45	0.026	12:45	0.112	0.073	0.073
9/5/2006	18:15	0.27	17:15	2.01	0.94	02:00	2.10	09:00	2.93	2.51	21:45	0.026	16:15	0.108	0.071	0.071
9/6/2006	09:15	0.25	15:00	2.09	1.12	12:45	2.26	19:00	3.05	2.66	14:15	0.026	18:45	0.138	0.072	0.072
9/7/2006	01:45	0.31	12:15	2.21	1.19	21:30	2.31	05:00	3.21	2.69	07:45	0.033	12:15	0.144	0.084	0.084
9/8/2006	16:00	0.30	09:30	2.18	1.10	08:15	2.20	12:00	2.91	2.53	10:15	0.032	09:30	0.128	0.077	0.077
9/9/2006	20:00	0.37	13:45	2.14	1.37	02:45	2.09	07:30	2.89	2.57	08:15	0.041	11:45	0.171	0.100	0.100
9/10/2006	21:15	0.34	06:30	2.49	1.21	01:45	1.80	21:15	2.91	2.41	14:15	0.024	06:30	0.161	0.075	0.075
9/11/2006	05:00	0.42	17:30	2.72	1.25	23:00	1.94	05:15	3.16	2.57	23:00	0.031	17:30	0.181	0.081	0.081
9/12/2006	03:30	0.30	11:00	3.39	1.32	23:45	1.72	06:00	2.86	2.39	23:15	0.022	12:00	0.155	0.090	0.090
9/13/2006	02:15	0.25	18:30	2.56	0.99	02:00	1.68	14:45	2.79	2.30	05:45	0.024	07:15	0.146	0.089	0.089
9/14/2006	05:45	0.28	21:15	2.23	1.16	23:00	1.70	16:30	2.88	2.34	11:45	0.012	17:30	0.129	0.087	0.087
9/15/2006	12:00	0.40	18:15	2.31	1.12	01:30	1.68	08:45	2.76	2.37	00:30	0.022	08:45	0.135	0.089	0.089
9/16/2006	03:00	0.26	09:15	3.00	1.04	21:30	1.73	18:15	2.95	2.32	01:15	0.021	10:15	0.156	0.084	0.084
9/17/2006	02:00	0.29	09:15	2.07	1.10	00:30	1.55	12:15	2.84	2.34	01:45	0.014	09:15	0.129	0.081	0.081
9/18/2006	18:45	0.38	14:00	2.35	1.00	00:00	1.48	16:00	2.54	2.13	02:30	0.007	19:15	0.118	0.063	0.063
9/19/2006	19:45	0.27	17:45	2.14	1.18	03:00	1.41	11:30	2.64	2.14	13:00	0.019	19:15	0.170	0.075	0.075
9/20/2006	08:00	0.30	09:15	2.08	1.02	00:30	1.51	14:30	2.64	2.11	22:15	0.027	08:45	0.146	0.074	0.074
9/21/2006	13:00	0.32	09:30	2.09	1.26	00:00	1.51	07:15	2.66	2.14	04:30	0.014	07:00	0.163	0.087	0.087
9/22/2006	22:00	0.29	07:00	2.97	1.36	15:15	1.62	20:15	2.83	2.21	15:15	0.018	19:00	0.152	0.089	0.089
9/23/2006	19:15	0.27	06:00	2.08	1.04	01:30	1.82	20:00	2.81	2.27	00:15	0.011	07:30	0.104	0.065	0.065
9/24/2006	22:15	0.31	12:00	2.71	1.05	06:30	1.95	21:45	2.76	2.33	19:15	0.012	12:00	0.152	0.067	0.067
9/25/2006	02:45	0.35	18:00	2.12	1.12	16:00	2.09	02:45	2.59	2.33	01:15	0.014	18:30	0.132	0.059	0.059
9/26/2006	22:30	0.35	05:30	2.26	1.24	16:15	1.77	19:45	3.00	2.40	15:00	0.026	18:45	0.126	0.064	0.064
9/27/2006	06:00	0.30	06:15	2.16	1.08	11:30	1.57	17:30	3.26	2.30	22:45	0.015	17:15	0.137	0.063	0.063
9/28/2006	15:45	0.33	05:45	1.97	1.08	01:30	1.83	07:15	3.10	2.53	01:30	0.015	18:15	0.116	0.063	0.063
9/29/2006	18:15	0.35	06:15	1.72	1.08	01:00	1.90	05:00	2.83	2.35	00:00	0.006	06:00	0.101	0.054	0.054
9/30/2006	23:30	0.37	11:00	1.71	1.06	03:15	1.53	13:00	3.03	2.36	23:30	0.008	08:15	0.100	0.057	0.057

Report Summary For The Period 9/1/2006 - 9/30/2006

Depth (in) : D Velocity (ft/s) : V Quantity (MGD - Total MG) : Q

	D	V	Q
Report Total			2.173
Report Avg	1.10	2.40	0.073

Braintree_FR1, Pipe Height: 8"

Weekly Detailed Report For The Period 9/1/2006 - 9/7/2006

100 Cross St | Braintree MA | Intersection of Cross St @ Linda Rd

Week 1 - Daily Flow View For The Period 9/1/2006 - 9/7/2006

Flow Data

Depth (in) : D Quantity (MGD - Total MG) : Q Velocity (ft/s) : V

Time	Friday 9/1/2006			Saturday 9/2/2006			Sunday 9/3/2006			Monday 9/4/2006			Tuesday 9/5/2006			Wednesday 9/6/2006			Thursday 9/7/2006		
	D	V	Q	D	V	Q	D	V	Q	D	V	Q	D	V	Q	D	V	Q	D	V	Q
00:00	0.99	2.17	0.024	0.37	2.24	0.073	2.66	0.082		0.49	2.63	0.089	0.70	2.31	0.081	0.60	2.32	0.082	0.66	2.69	0.037
00:15	0.92	2.66	0.036	0.95	2.46	0.031	2.56	0.087		0.70	2.73	0.033	0.33	2.49	0.088	1.19	2.46	0.062	0.57	2.59	0.008
00:30	1.09	2.69	0.039	0.39	2.00	0.062	2.59	0.087	0.73	0.53	2.66	0.094	0.28	2.42	0.085	0.43	2.49	0.088	1.27	2.63	0.057
00:45	1.03	2.63	0.028	0.32	2.39	0.075	2.36	0.069	0.44	0.68	2.69	0.033	0.47	2.29	0.081	0.98	2.69	0.039	0.51	2.73	0.103
01:00	0.44	2.59	0.082	0.22	2.46	0.077	2.59	0.088	0.66	0.70	2.49	0.088	0.33	2.52	0.074	0.86	2.59	0.038	0.45	2.76	0.105
01:15	0.31	2.63	0.083	0.25	2.07	0.064	2.42	0.082	0.45	0.90	2.56	0.040	0.59	2.46	0.087	0.52	2.52	0.069	0.79	2.49	0.004
01:30	0.63	2.56	0.028	0.51	2.26	0.070	2.52	0.086	0.95	0.70	2.79	0.099	0.70	2.42	0.085	0.91	2.56	0.034	0.82	2.63	0.009
01:45	0.29	2.69	0.086	0.22	2.42	0.075	2.46	0.043	1.10	0.94	2.73	0.096	0.39	2.29	0.081	1.01	2.66	0.044	0.31	2.66	0.008
02:00	0.66	2.49	0.079	0.31	2.22	0.069	2.63	0.069	0.84	0.39	2.46	0.087	0.51	2.10	0.074	0.80	2.66	0.094	0.73	2.59	0.008
02:15	0.61	2.56	0.071		2.22	0.069	2.59	0.070	0.55	0.33	2.69	0.095	0.92	2.36	0.059	0.80	2.66	0.094	0.37	2.63	0.009
02:30	0.36	2.63	0.084		2.19	0.068	2.66	0.073	0.78	0.26	2.83	0.100	0.64	2.56	0.084	0.62	2.69	0.041	0.66	2.63	0.009
02:45	0.28	2.63	0.084		2.32	0.072	2.56	0.078	0.45	0.30	2.79	0.082	0.67	2.42	0.085	0.53	2.42	0.028	0.36	2.49	0.007
03:00	0.56	2.79	0.044		2.22	0.069	2.79	0.095	0.39	0.25	2.59	0.091	0.57	2.36	0.083	1.21	2.63	0.039	0.38	2.56	0.007
03:15	0.34	2.66	0.086		2.26	0.070	2.66	0.090	0.87	0.83	2.66	0.094	0.66	2.42	0.085	1.39	2.42	0.041	0.82	2.59	0.048
03:30	0.84	2.63	0.040		2.12	0.066	2.83	0.056	1.54	0.42	2.56	0.090	0.58	2.36	0.083	1.12	2.69	0.056	0.39	2.66	0.101
03:45	0.30	2.59	0.083		2.22	0.069	2.73	0.034	0.93	1.09	2.63	0.033	0.57	2.26	0.076	1.05	2.66	0.043	0.42	2.42	0.002
04:00	0.24	2.52	0.064		2.32	0.073	2.59	0.035	0.87	0.29	2.56	0.090	0.74	2.63	0.093	1.14	2.42	0.028	1.00	2.42	0.039
04:15	0.48	2.49	0.036	0.36	2.32	0.083	2.66	0.090	0.97	0.23	2.59	0.091	0.45	2.59	0.091	0.58	2.36	0.083	1.35	2.89	0.079
04:30	0.54	2.42	0.067		2.42	0.075	2.56	0.053	0.34	0.65	2.59	0.091	1.06	2.74	0.097	1.08	2.32	0.082	0.93	2.66	0.039
04:45	0.61	2.46	0.072		2.42	0.075	2.73	0.093	0.41	0.24	2.59	0.091	0.46	2.69	0.095	1.11	2.52	0.049	1.88	3.06	0.117
05:00	0.62	2.46	0.079		2.12	0.066	2.59	0.088	0.52	0.36	2.59	0.091	0.37	2.66	0.094	0.61	2.52	0.049	1.02	3.21	0.125
05:15	0.99	2.26	0.034	0.67	2.46	0.078	2.76	0.040	0.97	0.73	2.66	0.080	0.33	2.39	0.084	1.13	2.66	0.037	1.59	2.76	0.068
05:30	0.60	2.46	0.076	0.29	2.39	0.076	2.69	0.050	1.06	0.28	2.59	0.091	0.41	2.56	0.090	1.71	2.63	0.067	1.14	2.86	0.059
05:45	1.15	2.32	0.046	0.69	2.26	0.020	2.52	0.086	0.42	0.46	2.56	0.090	0.33	2.63	0.084	2.01	2.42	0.107	1.95	2.96	0.099
06:00	0.99	2.39	0.038	0.51	2.22	0.069	2.79	0.095	0.68	0.32	2.39	0.084	0.44	2.56	0.090	0.95	2.73	0.037	0.77	2.96	0.113
06:15	0.50	2.36	0.082	1.11	2.59	0.041	2.86	0.033	0.55	0.43	2.49	0.037	0.53	2.63	0.037	0.52	2.89	0.108	2.02	2.86	0.106
06:30	1.00	2.42	0.044	0.58	2.09	0.021	2.66	0.030	0.48	1.09	2.79	0.099	0.96	2.69	0.036	1.40	2.93	0.079	1.38	2.76	0.070

CELLAR DRAINS

Sections:

13.06.010 Cellar drains prohibited; violations and penalties.

13.06.010 Cellar drains prohibited; violations and penalties.

No person shall install a ground water gravity connection from the interior of any building to the Town storm water drainage system. This does not prohibit the connection of exterior foundation drains to the Town storm water drainage system provided the foundation drain is above the elevation of the cellar floor. Violations shall be punishable by a fine of one hundred dollars ($100.00). (ATM 5-7-2003 Art 34. (part))

Attachment C-1

Braintree Bylaw Chapter 12.20
Wetlands

Rules and Regulations

Adopted on July 26, 2001

Braintree Bylaw Chapter 12.20 Wetlands
Rules and Regulations

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Appendix A Erosion Control Regulations

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Attachment A Standards for Haybale Sediment Traps and Silt Fences
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Rules and Regulations

In conjunction with Chapter 12.20, Section IX of the Braintree Bylaw [Wetland Bylaw], these Rules and Regulations are established to define key terms, to establish procedures governing the filing of Notices of Intent or Requests for Determination of Applicability and to set fees for the processing of a Notice of Intent. On July 26, 2001 the Conservation Commission voted to adopt these Rules and Regulations.

A. WAIVERS

Strict compliance with the Bylaw and these Rules and Regulations may be waived when, in the judgment of the Conservation Commission, such action is in the public interest and is consistent with the intent and purpose of the Bylaw. Any request for a waiver must be submitted to the Commission in writing at the time of filing.

B. DEFINITIONS

Abutter: See Braintree Bylaw Chp. 12.20 Sec. V.A.1. For purposes of these Rules and Regulations, directly opposite a water body shall mean located within 100' of subject property

Activity: any form of construction, reconstruction or expansion of any building, structure, road or alteration of the physical, chemical or biological characteristics of an area of land or water

Agriculture: See CMR 10:04.

Alter: See Braintree Bylaw Chp. 12.20 Sec. X.

Applicant: See Braintree Bylaw Chp. 12.20 Sec. X.

Certificate of Compliance: written determination by the Commission that all work authorized has been completed in accordance with the Order of Conditions

Conditions: those requirements set forth in a written Order issued by the Conservation Commission to regulate or prohibit any activity

Conservation Commission: Braintree Conservation Commission

Creek: See definition for "Stream."

Date of Receipt: date of delivery to the Department of Planning and Conservation

Determination of Applicability: written findings by the Conservation Commission as to whether a site or the work proposed thereon is subject to the jurisdiction of the Bylaw

Prevention of Pollution: the prevention or reduction of contamination of surface or ground water

Private Water Supply: any source of water available for private use

Public Water Supply: any source of water available, or potentially available, for public use as a designated water supply

Quorum: the majority of the Conservation Commission

Remove: taking away or moving any material thereby changing the elevation, either temporarily or permanently

River: See Braintree Bylaw Chp. 12.20 Sec. X.

Significant: plays a role in the protecting of the public interest under the Bylaw

Stream: a body of running water including brooks and creeks, continuous or intermittent, moving in a definite channel in the ground

Storm Damage Prevention: elimination or reduction of any damage caused by a storm

Water Pollution Prevention: See Prevention of Pollution [above].

Wildlife: mammals, birds, reptiles and amphibians and all vertebrate and invertebrate animal species listed by the Massachusetts Division of Fisheries and Wildlife as endangered, threatened or of special concern

Work: See "Activity."

Zone of Saturation: the subsurface zone in which all open spaces are filled with water

C. FORMS

All forms must be approved by the Commission prior to their use and will be available from the Department of Planning and Conservation. The same forms as those required by MGL Chp. 131 Sec. 40 may be submitted if notice is given of application per Braintree Bylaw Chp. 12.20.

D. INCOMPLETE SUBMISSION

If the Commission determines that an application is incomplete, it shall notify the applicant within 21 days of the date of receipt.

- a check to the Town of Braintree for the $75 local filing fee;
- 4 copies of the application and plans. [Plans may be submitted in half size.]

F. REQUEST FOR DETERMINATION OF APPLICABILITY

Any person who desires a determination as to whether the Bylaw applies to an area or to work to be performed on said area shall submit a written request to the Braintree Conservation Commission.

Submission Requirements

1) The applicant shall provide five copies of the complete application to the Conservation Commission and proof that two copies have been sent Certified Mail to DEP [DEP Wetlands, 205A Lowell St., Wilmington MA 01887]

2) The applicant shall compile a List of Direct Abuttors - based on the most recent Assessors' records and including those adjacent to a road, across a water body or in another municipality.

3) A stamped envelope addressed to each abuttor in the order the names appear on the List of Abuttors shall be submitted with application.

4) If the applicant is not the owner, the applicant shall furnish proof that the owner has been notified of the filing of the Request.

5) The applicant should provide as much detail as possible concerning the area and work activity proposed. Include plans, maps, location of wetland resource areas, and mitigating methods to control erosion, prevent pollution and protect wetlands (haybales, silt fence, revegetation, limit of work, etc.). The Commission needs sufficient information to determine the location of and potential impact to wetland resource areas.

6) Federal Emergency Management Administration National Flood Insurance Program Elevation Certificate may be required if work is in Land Subject to Flooding.

Hearing Date

From the date of filing the Conservation Commission has 21 days to open a public hearing. If there is not sufficient time to advertise before the next meeting or if the next meeting is more than 21 days from the date of filing, the applicant shall be asked to sign to extend the 21 day deadline. The applicant shall be billed for the required newspaper advertisement of the public hearing.

4) runoff plan and calculations for the 2, 10, 25 and 100 Year Storm Events using appropriate methodology and showing existing and proposed runoff conditions for comparative purposes
5) hydrographs that illustrate runoff characteristics before and after the proposed activity

H. CHANGE IN SUBMITTED PLANS

Should there be any significant change in proposed activity subsequent to filing an application, the applicant must notify the Commission in writing. No work shall be done on the subject area until the Commission has reviewed the changes. Within 21 days of receipt of notification of changes, the Commission shall determine if a new application must be filed.

I. CERTIFICATE OF COMPLIANCE

A Certificate of Compliance will be issued only after a project is completed in its entirety. An applicant shall request in writing a Certificate of Compliance and provide the Commission with As-Built plans.

Certified Professional: a person certified as a geologist or who holds a Massachusetts license as a professional engineer or landscape architect

Construction Activity: developing, redeveloping, enhancing and maintaining land, including but not limited to land disturbance, building construction, paving and surfacing, storage and disposal of construction related materials

Development: any construction or grading activities

Dewatering: removal and disposal of surface water or ground water to prepare a site for construction

Directly Drains: conveyance and discharge of *runoff*, either on the surface or by an open channel or pipe, into an adjacent water body

Disturbed Area: an area where the ground cover is destroyed or removed

Erosion: detachment and movement of soil or rock fragments by water, wind, ice or gravity

Erosion Prevention: measures to prevent and/or minimize erosion, sedimentation and other impacts associated with construction activities

Grading: excavating, grubbing, filling or stockpiling of earth materials

Highly Erodible Soils: soil map units classified as such by the Natural Resources Conservation Service

Land Disturbance: activities that can change the physical conditions of landform, vegetation or hydrology including but not limited to clearing, grading, grubbing, excavation, filling and storing of materials

Soil: any unconsolidated mineral or organic material

Untreated Runoff: contaminated runoff that has not been filtered, screened, settled or otherwise treated for removal of pollutants prior to discharge into a stormwater system or adjacent water body

Water Body: permanent or intermittent bodies of water including creeks, streams, ponds, rivers, lakes, drainage channels and wetlands

Wetland: any land which meets local, state or federal definition of wetland and is subject to the jurisdiction of the *Commission*

D. APPLICABILITY

1) These regulations shall apply to every Notice of Intent [NOI] where:

- neighboring areas that might be affected by the development, i.e. roads, water bodies and residences;
- the soils on site including soil names, map unit, erodibility, permeability, texture and soil structure;
- areas with potentially serious erosion problems;
- the methods which will be used to control runoff, erosion and sedimentation;
- specifications and calculations of how the site will be stabilized during and after construction;
- maintenance activities for the *Control Measures*.

3) Said *Plan* shall have a Site Plan which includes:

- north arrow, scale, benchmark and datum;
- existing and final contours at 2' intervals extending at least 50' beyond the site's boundary;
- existing vegetation including tree lines, grassy areas and unique vegetation;
- boundaries of the different soil types on site;
- property lines;
- elevations of streets, parking lots, water levels of ponds and wetlands, storm sewer inlets and outlets and the first floor of all existing and proposed structures;
- drainage dividing lines and direction of flow for the catchment areas on site during and after construction;
- areas with potentially serious erosion problems;
- limits of clearing and grading;
- location of
  a) utilities,
  b) *Control Measures* to be installed on site illustrated with detail drawings,
  c) off-site and on-site access routes for construction and maintenance vehicles,
  d) borrow and waste disposal areas,
  e) debris and garbage disposal area ;
- vegetation specifications for temporary and permanent stabilization;
- methods and location of concrete-wash disposal.

G. DESIGN STANDARDS

1) Development shall be fitted to topography and soils so as to minimize erosion.
2) In no event shall any site work be started prior to the starting date specified in the *Plan*.
3) Natural vegetation shall be retained and protected wherever possible.
4) Clearing, grading or other site work shall be performed in a manner that will minimize erosion and shall be limited to the area of immediate construction operations and for the shortest period of time practical.
5) Site drainage shall be designed to effectively treat increased runoff created during and after construction so that adjacent properties and downstream water bodies are protected from erosion.

- describe steps to take if *Control Measures* prove inadequate,
- provide forms and instructions for record keeping,
- list the names and personnel assigned to each task and the training needed to perform each job.

2) *Control Measures* installed under these regulations shall be adequately maintained in perpetuity in accordance with the *Plan* by the applicant and any owner of lots on which said measures have been installed.

I. INSPECTION AND ENFORCEMENT

The *Commission* shall enforce these regulations. If the *Commission* or its staff finds that on-site conditions are in violation of these regulations or not as stated in the *Plan*, the *Commission* may issue a stop work order and direct the applicant to take corrective measures.

J. CONSTRUCTION CERTIFICATION BY REGISTERED PROFESSIONAL

For any site which requires a professional site plan, the *Commission* may require that a certified professional verify in writing that all *Control Measures* have been installed in accordance with the *Plan*.

K. SEQUENCING OF CONTROL MEASURES

If a project is so large or complex that a Plan encompassing the total project cannot reasonably be prepared prior to initial groundbreaking, an applicant may seek authorization from the *Commission* to undertake major grading activities incrementally. Approval by the *Commission* of phased grading activities shall take place in two steps. The applicant shall submit to the *Commission* for review and approval:

1) a conceptual plan of the entire development, and
2) detailed plans prepared by a Professional Engineer registered in the Commonwealth for each phase of the project showing the nature and extent of the work to be completed in that phase.

STANDARDS FOR HAYBALE SEDIMENT TRAPS AND SILT FENCES

A. APPLICABILITY

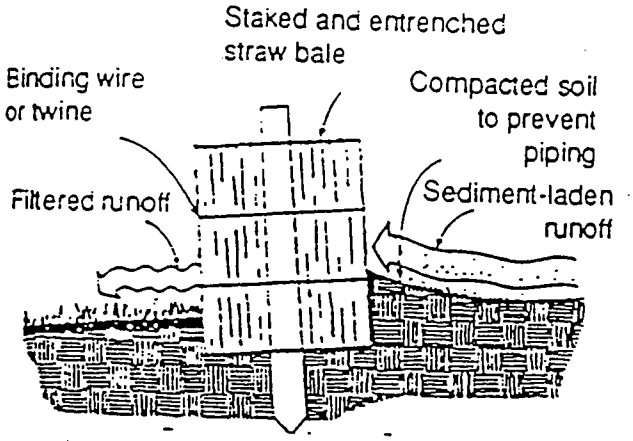
Either silt fences or haybales may be used as an erosion control measure when appropriate. If the use of haybales are proposed, said haybales may be used only with the approval of the Commission.

B. PERFORMANCE STANDARDS

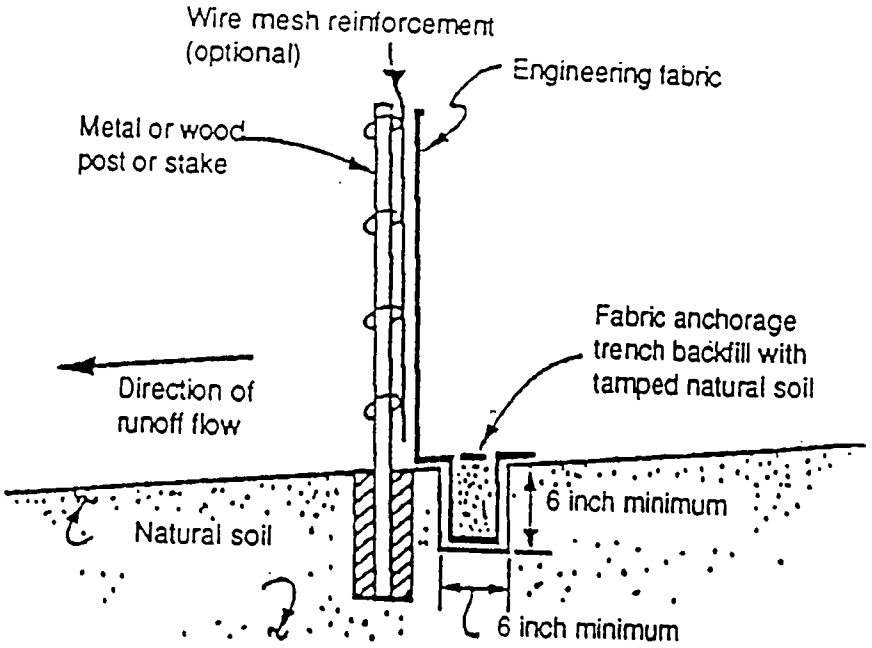
Staked haybales or silt fences may be used as an erosion control measure only where the drainage area is less than two acres, the maximum uncontrolled slope length above the haybales or silt fence is 150', the water reaches the haybales or silt fence as sheet flow and any ponding created will not cause property damage or a safety hazard.

C. DESIGN RECOMMENDATIONS

1. The following construction details shall be incorporated onto the record set of plans for any project proposing to use haybales and/or silt fence for erosion control:



Cross section of a properly installed haybale



Note: Depending upon configuration, attach fabric to wire mesh with hog rings, steel posts with tie wires, or wood posts with staples.

Typical installation for silt fence

2. Haybales and/or silt fence shall be installed along the contour and constructed so that the flow cannot bypass the ends.

3. Soil shall be compacted on the upslope side of the haybales as shown in the detail and loose straw shall be wedged between the haybales.

4. If the silt fence is longer than 600', it shall be constructed in separate, independent units with each unit having a length of 600'.

5. Haybales shall be trenched 4" into the ground and shall be staked by steel fence posts or 2" x 2" wood stake with the stakes angled towards the previously laid haybale [as shown on the construction detail].

6. Silt fences may be constructed with or without supporting fencing as shown on the construction detail. If support fences are included, they shall be strong enough to withstand the load from ponded water and trapped sediment and the support posts should be spaced at 10' or less and should be driven at least 1' into the ground. If support fences are not used, the posts shall be spaced at 4' or less. Posts shall be placed or driven at least 2' into the ground. Posts shall be 4 inch diameter wood posts or standard steel fence posts weighing no less than 1.3 pounds per linear foot, with a minimum length of 30" plus burial depth.

7. Silt fence shall be anchored in a trench dug on the upslope side of the posts. The trench shall be at least 6" deep and 6" wide. The fabric shall be laid in the trench which is then backfilled and compacted as shown on the construction detail.

8. The filter fabric shall be furnished in a continuous roll to avoid splices. When a splice cannot be avoided, it shall be made at a fence post. The fabric shall be overlapped 6 inches, folded over and securely fastened.

D. **MAINTENANCE**

All haybales and/or silt fences shall be inspected immediately after each runoff event and at least daily during prolonged rainfall. Any required repairs should be made immediately including replacing deteriorated, destroyed or rotted haybales. When sediment deposits reach approximately one-half the height of the haybales or silt fence, the sediment shall be removed.

Attachment B

EROSION AND STORMWATER CONTROL PLAN

Check List

The following items should be incorporated with respect to specific site conditions in an Erosion Control Plan:

LOCATION INFORMATION

____ Project Location
____ Roads, Streets
____ North Arrow
____ Scale
____ Adjoining Lakes, streams or other major drainage ways

GENERAL SITE FEATURES

____ Legend
____ Existing contours
____ Proposed contours
____ Limit & acreage of disturbed area
____ Planned & existing building locations & elevations
____ Planned & existing road locations & elevations
____ Lot and/or building numbers
____ Land use of surrounding areas
____ Rock outcrops
____ Seeps or springs & wetland limits
____ Easements, streams, lakes, ponds, drainage ways & dams
____ Boundaries of the total tract
____ Borrow and/or waste areas
____ Stockpiled topsoil or subsoil locations
____ Street profiles

SITE DRAINAGE FEATURES

____ Existing & planned drainage patterns, [include off-site areas that drain through the project area]
____ Size of areas [acreage]
____ Size & location of culverts & sewers
____ Soils information [type & special characteristics]
____ Design calculation for peak discharges of runoff [including the construction phase & final runoff coefficients of the site]
____ Design calculations, cross sections & methods of stabilization of existing & planned channels [include temporary linings]
____ Design calculations & construction details of energy dissipators below culverts & storm sewer outlets [for rip rap aprons, include stone sizes (diameters) & apron dimensions]
____ Soil information below culvert & storm sewer outlets
____ Design calculations and construction details to control groundwater, i.e. high water table
____ Name of receiving watercourses or name of municipal operator [only where stormwater discharges are to occur]

EROSION CONTROL MEASURES

____ Location of temporary & permanent measures
____ Construction drawings and details for temporary & permanent measures
____ Design calculations for sediment basins & other measures
____ Maintenance requirements during construction
____ Person responsible for maintenance during construction
____ Maintenance requirements & person responsible for maintenance measures after construction

VEGETATIVE STABILIZATION

____ Areas & acreage to vegetatively stabilize
____ Planned vegetation with details of plants, seeds, mulch & fertilizer
____ Specifications for permanent & temporary vegetation
____ Method of soil preparation

OTHER REQUIREMENTS

____ Narrative describing construction sequence
____ Narrative describing the nature & purpose of construction activity
____ Construction sequence related to sedimentation & erosion control [including measures to be installed prior to the start of grading & their removal when disturbed areas have been permanently stabilized]

SECTION XI
EROSION CONTROL

Attachment C-2

A. General

These regulations are designed to allow broad discretion for addressing the impacts from construction activities so long as erosion and storm water runoff control measures [control measures] comply with the objectives and standards outlined below. These regulations do not specify or mandate specific control measures, but provide the flexibility to choose or design control measures subject to review by the Planning Board.

The objectives of these regulations are:

- to reduce environmental damage from sediment and erosion by requiring adequate provisions to control storm water runoff [runoff] and by protecting exposed or disturbed areas
- to restrict runoff entering or leaving sites to non-erosive velocities through the use of control measures so that surface and ground water quality are protected, erosion is minimized and flooding potential is reduced
- to assure that control measures are incorporated into site planning at an early stage in the design process
- to prevent the unnecessary stripping of vegetation and loss of soils, especially adjacent to water bodies
- to prevent construction activities that may cause mass movement, slumping, or erosion of land surfaces
- to prevent excess turbidity in water bodies
- to eliminate costly maintenance and repairs to roads, embankments, swales, streams, water bodies, storm water control facilities, and adjoining lots

B. Applicability

These regulations shall apply to every definitive plan application where:

- site work involves the excavation or placement of more than 100 cubic yards of material, disturbs cumulatively more than 5,000 SF, or will occur on a slope greater than 15%
- a site contains highly erodible soils or drains directly into a water body
- a retention pond or basin of 1,000 SF or more in size will be created
- the Board determines that there is a high potential for environmental degradation from erosion or runoff

C. Erosion and Storm Water Runoff Controls

A description of erosion and storm water runoff controls [description] shall be submitted with every application subject to this section and shall be prepared in accordance with the methods and measures identified in the following publications:

- "The Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide For Planners, Designers, and Municipal Officials" [EOEA] and

- "Guidelines for Soil and Water Conservation in Urbanizing Areas of Massachusetts" [Natural Resources Conservation Service]

1) Said description shall include:

   a) The nature and purpose of the development and the amount of grading involved
   b) The proposed stages of development including start and completion dates, the sequence of construction and grading activities, the sequence for installing control measures and for final stabilization
   c) Current site conditions
   d) Neighboring areas that might be affected by the development, i.e. roads, water bodies and residences
   e) The soils on site including soil names, map unit, erodibility, permeability, texture and soil structure
   f) Areas with potentially serious erosion problems
   g) The methods which will be used to control runoff, erosion and sedimentation
   h) Specifications and calculations of how the site will be stabilized during and after construction
   i) A maintenance component:
      (1) identifying all of the control measures that will be inspected and maintained
      (2) providing an inspection schedule for each control measure
      (3) listing typical maintenance procedures for each control measure
      (4) describing steps to take if control measures prove inadequate
      (5) providing forms and instructions for record keeping
      (6) listing personnel assigned to each task and the training needed to perform each job

2) In addition, the applicant shall submit an Erosion and Storm Water Runoff Plan which shall include:

   a) North arrow, scale, benchmark and datum
   b) Existing and final contours at 2' intervals extending at least 50' beyond the site's boundary
   c) Existing vegetation including tree lines, grassy areas and unique vegetation
   d) Boundaries of the different soil types on site
   e) Property lines
   f) Elevations of streets, parking lots, water levels of ponds and wetlands, storm sewer inlets and outlets and the first floor of all structures
   g) Drainage dividing lines and direction of flow for the catchment areas on site during and after construction
   h) Areas with potentially serious erosion problems
   i) Limits of clearing and grading
   j) Location of utilities, control measures to be installed on site with detail drawings, off-site and on-site access routes for construction and maintenance vehicles, borrow and waste disposal areas, and debris and garbage disposal area
   k) Vegetation specifications for temporary and permanent stabilization
   l) Methods and location of concrete-wash disposal

3) Development shall not begin until the control measures identified are installed and functional. The Board may require that a certified professional verify in writing that all control measures have been installed in accordance with the description. All control measures shall be maintained to comply with the description.

4) Control measures shall be maintained in perpetuity and in accordance with the description by either the applicant or any owner of a lot on which said measures have been installed.

D. Sequencing of Control Measures

If a project is so large or complex that a narrative of the entire project cannot reasonably be prepared prior to initial groundbreaking, an applicant may seek authorization from the Board to undertake major grading activities incrementally. Approval by the Board of phased grading activities shall take place in two steps. The applicant shall submit to the Board for review and approval:

1) a conceptual plan of the entire development, and

2) detailed plans prepared by an RPE for each phase of the project showing the nature and extent of the work to be completed in that phase.

E. Standards

1) Development shall be fitted to topography and soils so as to minimize erosion.

2) In no event shall any site work be started prior to the starting date specified in the narrative.

3) Natural vegetation shall be retained and protected wherever possible.

4) Clearing, grading or other site work shall be performed in a manner that will minimize erosion and shall be limited to the area of immediate construction operations and for the shortest period of time practical.

5) Site drainage shall be designed to effectively treat increased runoff created during and after construction so that adjoining lots and downstream water bodies are protected from erosion.

6) Uncontrolled runoff shall not be diverted onto adjoining lots or into the storm drain or sewer system. Said runoff shall be disposed of at non-erosive velocities at established drainage locations.

7) Sediment transported by runoff shall be retained on site through the use of sediment basins, silt traps or other appropriate measures which, to the extent possible, shall be installed before clearing and grading begin.

8) Cut and fill slopes shall be constructed in a manner that will minimize erosion. No slope shall be steeper than 2:1[horizontal to vertical] unless approved by the Board.

9) Diversions or other appropriate measures shall be installed at the top of cut and fill slopes to prevent uncontrolled drainage flows on the disturbed slopes.

10) Drainage swales used to divert runoff shall be vegetated and stabilized to control erosion in concentrated flow areas.

11) All functioning storm drain inlets shall be protected so that runoff will not enter the conveyance system without first being filtered or otherwise treated to remove sediment.

12) Suitable control measures, such as temporary seeding or mulching, shall be used to protect critical areas exposed during construction.

13) A site shall be maintained and/or watered to prevent dust erosion.

14) Grading shall not be permitted to continue if the Board determines that dust is significantly impacting adjoining lots or ways.

15) Topsoil shall be stockpiled on site to the extent practicable for use on areas to be revegetated. Said soil shall be protected so that it does not erode.

16) Stockpiled construction materials shall be protected so that they do not erode. Excavated materials shall not be deposited or stored near water bodies unless authorized by the Board.

17) Construction equipment shall not cross or disturb stream channels except at approved crossings.

18) In areas of the site where construction activities will cease for more than 21 days, or have permanently ceased, temporary vegetation or other stabilization measures shall be initiated within 14 days of cessation of said activities, weather permitting.

19) Where inadequate vegetation exists, temporary or permanent vegetation shall be established.

20) Permanent protective vegetation and erosion control structures shall be installed as soon as practical and shall not be considered established until the ground cover is mature enough to control erosion satisfactorily. Ground cover shall not be considered mature until at least two growing seasons have elapsed.

21) Whenever access routes for construction vehicles intersect public roads, provisions shall be made to minimize the transport of sediment by runoff or by vehicles onto said roads. When sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day, or more often if required by the Board.

(1) Areas from which trees have been removed and which are visible from a street shall be implanted with trees using five- to ten-year-old stock.

(2) Except for exposed rock ledge, disturbed areas shall be spread with a minimum of six inches of topsoil and planted with grass or other ground cover suitable to erosion.

(3) All earth and vegetative debris shall be removed and lawfully disposed of.

(4) All slopes shall be graded so as not to exceed a slope that is two horizontal to one vertical. A steeper slope may be allowed if an RPE certifies that said slope will be stable, will not endanger an adjoining lot, deposit debris on a public way or interfere with any existing drainage course. The slopes of cut and fill surfaces shall be no steeper than is safe for the intended final uses.

E. Approval. In approving a special permit, the SPGA may impose reasonable conditions to regulate quarry operations and and hours of operation.

F. Bonding. The SPGA may require a bond or other security to be provided to the Town to insure compliance with the special permit.

G. Time frame. Any special permit for a quarry operation shall automatically expire within the time frame specified in the special permit or within 24 months if no time limit is specified. To request an extension a quarry operator must submit a written request 60 days prior to expiration of the special permit. The SPGA, at its discretion, may extend a permit or may require a public hearing on said extension.

H. Existing quarry operations. A quarry in lawful operation on the date of adoption of § 135-1202 may continue until such time it is abandoned. However, unless specifically authorized by a new special permit:

(1) The depth of excavation shall not exceed the grade of the lowest point excavated on the date of adoption of § 135-1202.

(2) The total area of land disturbance within the quarry operation shall not be increased by more than 50% over the area disturbed on the date of adoption of § 135-1202.

(3) The average daily amount of materials extracted or removed shall not be increased by more than 50% over the daily average for the 12 consecutive months preceding the date of adoption of § 135-1202 or for the actual period of operation, if less than 12 months.

§ 135-1203. Erosion control regulations. [Added 5-7-2003 ATM by Art. 38]

A. Preamble. Uncontrolled excavation, grading and land disturbance may cause excessive quantities of soil to erode. Erosion, and resulting sediment, requires the costly repair of roads and embankments; creates excess turbidity; clogs storm drains and swales; muddies streams; silts rivers and lakes and limits the use of water for most beneficial purposes. Sediment-choked streams are unsightly, and reduced channel capacity may result in flooding.

B. Purpose. The purposes of the erosion control regulations are to:

(1) Reduce damage from sediment and erosion by controlling stormwater runoff (runoff) and by protecting exposed or disturbed areas;

(2) Protect surface and ground water quality, minimize erosion and reduce flooding by restricting runoff to nonerosive velocities through the use of erosion and runoff control measures (control measures);

(3) Incorporate control measures into site planning at an early stage in the design process;

(4) Prevent the unnecessary stripping of vegetation and loss of soils especially adjacent to water bodies;

(5) Prevent land disturbance that may cause mass movement, slumping or erosion of land surfaces;

(6) Prevent excess turbidity in water bodies;

(7) Minimize maintenance and repairs to roads, embankments, swales, streams, water bodies, stormwater control facilities, and adjoining lots;

(8) Retain appropriate performance guaranties to ensure compliance with permits.

C. Intent. Section 135-1203 allows broad discretion to address the impacts from land disturbance so long as control measures comply with the objectives and design standards. Section 135-1203 therefore does not specify or mandate specific control measures. They provide the flexibility to choose control measures subject to review by the SPGA. Section 135-1203 is intended to supplement provisions of the Wetlands Protection Act (Act). Where § 135-1203 is less restrictive than the Act, the provisions of the Act shall govern.

D. Applicability.

(1) Section 135-1203 shall apply to every land disturbance where:

(a) Site work involves excavating or filling more than 150 cy of material;

(b) Site work cumulatively disturbs more than 5,000 square feet;

(c) Site work will occur on a slope greater than 15%;

(d) A site contains highly erodible soils;

(e) A site directly drains into a water body; or

(f) The SPGA determines that there is a high potential for environmental degradation from erosion or runoff.

(2) A single-family residential site may be exempted from § 135-1203, provided land disturbance will not disturb more than 5,000 square feet and adequate control measures are incorporated into a development.

E. Application for erosion control permit. Persons wishing to engage in land disturbance activities shall apply to the SPGA for an erosion control permit in accordance with these regulations and said activities shall not begin unless said permit has been issued.

F. Erosion and stormwater runoff control plan. Application for an erosion control permit shall be accompanied by an erosion and stormwater control plan and report prepared and stamped by a RPE in accordance with the methods and measures identified in:

"The Massachusetts Erosion and Sediment Control Guidelines for Urban and Suburban Areas: A Guide For Planners, Designers, and Municipal Officials" (EOEA)

"Guidelines for Soil and Water Conservation in Urbanizing Areas of Massachusetts" (Natural Resources Conservation Service)

The erosion and stormwater control plan shall be of appropriate scale to show location and details of all proposed activities and shall include, where applicable:

(1) North arrow, scale, benchmark and datum;

(2) Wetlands, water bodies and floodplains;

(3) Existing and final grades at two-foot contour intervals extending at least 50 feet beyond the site's boundary;

(4) Existing vegetation, including existing tree lines, grassy areas and unique vegetation;

(5) Boundaries of the different soil types on site;

(6) Property lines;

(7) Plans and elevations of streets, parking lots, water level of water bodies and wetlands, storm sewer inlets and outlets and the first floor of all existing and proposed structures;

(8) Drainage dividing lines and direction of flow for the catchment areas on site during and after construction;

(9) Areas with potentially serious erosion problems;

(10) Limits of clearing and grading;

(11) Location of utilities;

(12) Location of the control measures to be installed on site illustrated with detail drawings;

(13) Location of off-site and on-site access routes for construction and maintenance vehicles;

(14) Locations of borrow and waste disposal areas;

(15) Vegetation specifications for temporary and permanent stabilization;

(16) Methods and location of concrete-wash disposal.

An erosion and stormwater control report shall include where applicable:

(1) The nature and purpose of the development and the amount of grading involved;

(2) The proposed stages of development including start and completion dates, the sequence of construction and grading activities, the sequence for installing control measures and for final stabilization;

(3) Conditions on the site as they currently exist;

(4) Neighboring areas such as roads, water bodies and residences that might be affected by the development;

(5) The soils on site, including soil names, map unit, erodibility, permeability, texture and soil structure;

(6) Areas with potentially serious erosion problems;

(7) The methods which will be used to control runoff, erosion and sedimentation;

(8) Specifications and calculations of how the site will be stabilized during and after construction;

(9) The maintenance activities to be performed on the control measures.

G. Design standards.

(1) Development shall be fitted to topography and soils so as to minimize erosion.

(2) Land disturbance activity work shall not begin prior to the starting date specified in the plan.

(3) Natural vegetation shall be retained and protected wherever possible.

(4) Clearing, grading or other site work shall be done in a manner that will minimize erosion. Said activities shall be limited to the area required for immediate construction operations and for the shortest practical period of time.

(5) Site drainage shall be designed to effectively treat increased runoff created during and after construction so that adjoining lots and downstream water bodies are protected from erosion.

(6) Uncontrolled runoff shall not be diverted onto adjoining lots or into the storm drain or sewer system. Said runoff shall be disposed of at nonerosive velocities at established drainage locations.

(7) Sediment transported by runoff shall be retained on site through the use of sediment basins, silt traps or other appropriate measures. Said measures shall be installed prior to clearing and grading to the extent practical.

(8) Cut and fill slopes shall be constructed so as to minimize erosion. Slopes shall not be steeper than two horizontal to one vertical unless approved by the SPGA.

(9) Diversions or other appropriate measures shall be installed at the top of cut and fill slopes to prevent uncontrolled drainage flows on the disturbed slopes.

(10) Drainage swales used to divert runoff shall be vegetated and stabilized to control erosion in concentrated flow areas.

(11) Storm drain inlets shall be protected so that runoff will not enter conveyance systems without first being filtered or otherwise treated to remove sediment.

(12) Either temporary seeding, mulching or other suitable control measures shall be used to protect exposed critical areas during construction.

(13) A site shall be maintained and/or watered to prevent dust erosion.

(14) Grading shall not be permitted to continue if the SPGA determines that dust is significantly impacting adjacent ways or property.

(15) Topsoil shall be stockpiled on site to the extent practicable for use on areas to be revegetated. Said soil shall be protected so that it does not erode.

(16) Stockpiled construction materials shall be protected so that they do not erode.

(17) Excavated materials shall not be deposited or stored near water bodies unless authorized by the SPGA.

(18) Construction equipment shall not cross or disturb stream channels except by means of approved crossings.

(19) In areas of the site where construction activities will cease for more than 21 days or have permanently ceased, temporary vegetation or other stabilization measures shall be initiated, weather permitting, within 14 days.

(20) Where inadequate vegetation exists, temporary or permanent vegetation shall be established.

(21) Permanent protective vegetation and erosion control structures shall be installed as soon as practical in the development. Permanent vegetation shall not be considered established until the ground cover is mature enough to satisfactorily control erosion. Ground cover shall not be considered mature until at least two growing seasons have elapsed.

(22) Whenever construction vehicle access routes intersect public roads, provisions shall be made to minimize the transport of sediment (mud) by runoff or vehicle tracking onto said roads. Where sediment is transported onto a public road surface, the road shall be cleaned thoroughly at the end of each day or more often as required by the SPGA.

H. Maintenance.

(1) All plans shall include a maintenance element which shall:

(a) Identify all of the control measures that will be inspected and maintained;

(b) Provide an inspection schedule for each control measure;

(c) List typical maintenance procedures for each control measure;

(d) Describe steps to take if additional repair is required;

(e) Provide forms and instructions for record keeping;

(f) List the names of personnel assigned to each task and the training needed to be able to do the job.

(2) An applicant carrying out control measures under these regulations, and all subsequent owners of lots on which said measures have been installed, shall adequately maintain said measures in accordance with the plan.

I. Inspection and enforcement. The Inspector of Buildings shall enforce these regulations. If the Inspector of Buildings finds that on site conditions are in violation of these regulations or not as stated in the plan, the Inspector of Buildings may issue a stop-work order and direct the applicant to take corrective measures.

J. construction certification by registered professional. For any site which requires a professional site plan the SPGA may require that a certified professional verify in writing that all control measures have been installed in accordance with the plan.

K. Sequential applications. If a project is so large or complex that a plan encompassing the total project cannot reasonably be prepared prior to initial groundbreaking, an applicant may seek authorization from the SPGA to undertake major grading activities incrementally. Approval by the SPGA of phased grading activities shall take place in two steps:

(1) An overall conceptual plan of the entire development shall be submitted to the SPGA for review and approval.

(2) Detailed plans showing the nature and extent of the work to be completed during each phase shall be prepared by an RPE and submitted to the SPGA for review and approval.

§§ 135-1204 and 135-1205. (Deleted by amendment)

(Cont'd on page 13595)

EPA/COE/MEPA PERMITS

58. Prior to starting any Authorized Activity, the Applicant shall provide proof to the Department that it has received a NPDES [National Pollution Discharge Elimination System] Permit.

59. Prior to starting any Authorized Activity, the Department shall be given a copy of the Section 61 Finding as issued by MHD and DEP.

EROSION CONTROL

60. Prior to starting any Authorized Activity, adequate erosion and sedimentation control shall be implemented. Said measures shall be maintained throughout the project and until all disturbed areas have been permanently stabilized with either an adequate vegetative or asphalt cover in accordance with the Plans.

61. All vegetative areas that are disturbed shall be revegetated immediately following the completion of site work. If adverse weather precludes immediate revegetation, the disturbed areas shall be stabilized with either a three to six inch cover of mulch or other erosion control measure acceptable to the Department.

62. Prior to starting any Authorized Activity, the Applicant shall implement the erosion control activities shown and detailed on the plan sheets entitled "Erosion & Sedimentation Control Plan [Sheets 57 through 69 of the Plans].

63. All disturbed areas where there is a slope greater than 10% on which work has ceased for more than 14 days shall be temporarily stabilized as needed with hay, straw, mulch or any other protective covering or method approved by the U.S. Soil Conservation Service [SCS].

64. Should the Department determine that adequate erosion control measures are not being maintained, the SPGA may require additional erosion control measures to be taken.

65. The Applicant shall immediately control any erosion problems that occur on site and shall notify the Department of said problems and of the corrective action(s) taken.

66. Erosion control devices shall be inspected regularly and after every storm event and hay bales or other devices shall be replaced as necessary. Any entrapped silt shall be removed to an area outside the buffer zone and wetland Resource Areas.

67. Temporary vegetation or other erosion stabilization measures shall be implemented, weather permitting, within 14 days in areas of the site where construction activities will cease for more than 21 days or have permanently ceased. If the season is not appropriate for plant growth, exposed surfaces shall be stabilized by straw, jute netting or other SCS-approved methods. Any stabilization materials such as jute netting shall be firmly anchored to prevent them from being washed from slopes by rain or flooding.

68. All exposed soils shall receive a minimum of two inches of loam or topsoil prior to seeding and final stabilization.

69. During development of the site and until As-Built approval has been voted by the SPGA, the Applicant shall be responsible for street cleaning of Pearl, Liberty and Middle Streets in the vicinity of the project as needed. The Department staff shall monitor this area for compliance with this Condition and, if determined unsatisfactory, shall notify the Applicant to clean the affected areas within 48 hours. If within 48 hours the area has not been cleaned, the Department staff shall notify the Braintree Highway Department to sweep the affected areas of Pearl, Liberty and Middle Streets with all expenses to be paid by the Applicant. All outstanding expenses shall be paid by the Applicant prior to release of any surety and/or As-Built approval. Nothing herein shall affect the Applicant's right to contest any assessment applied under this condition.

70. All debris, fill, and excavated material shall be stockpiled at areas shown on the Plans. At no time shall any debris or other material, other than fill allowed by this approval, be buried or disposed of within the floodplain.

§ 135-1111. Appeals.

Appeals of an adverse decision shall be made to the Superior Court. The Court's review shall be limited to whether the decision was supported by substantial evidence.

§ 135-1112. Penalties.

A. Any person who violates any provisions of this bylaw, if convicted, shall be fined an amount not to exceed $50 a day.

B. Each day that the offense continues shall be considered to be a separate violation.

§ 135-1113. Conflict with other regulations.

The provisions contained within this bylaw shall not relieve any person from complying with other laws, statutes, codes, regulations or bylaws of the Commonwealth of Massachusetts or the Town of Braintree.

§ 135-1114. Severability.

If any of the provisions of this bylaw are held to be unconstitutional or otherwise invalid by any court of competent jurisdiction, the remaining provisions will remain in force.

ARTICLE XII
Grading Regulations, Quarry Operations and Erosion Control Regulations
[Amended 5-11-1994 ATM by Art. 56; 10-18-1999 STM by Art. 29; 5-7-2003 ATM by Art. 37]

§ 135-1201. Grading regulations.

A. Purpose. The purposes of the grading regulations are to:

(1) Protect the safety, health and welfare of the residents of Braintree by regulating grading activities;

(2) Minimize adverse impacts associated with grading;

(3) Prevent damage to property, public facilities and utilities;

(4) Prevent the destruction of vegetation and the loss of soils by minimizing soil erosion and sedimentation;

(5) Minimize surface water runoff and diversion that may contribute to flooding and loss of water quality.

B. Applicability.

(1) With the exception of the activities listed in § 135-1201C, no grading shall occur on a site without a building permit or grading permit (Quarries are further regulated under § 135-1202.)

(2) The Inspector of Buildings may issue a building permit for grading, where grading:

(a) Has cuts or fills of less than two feet in depth at the deepest points measured from existing grade;

(b) Imports or exports less than 150 cubic yards (cy) of material;

(c) Cumulatively disturbs less than 5,000 square feet of area;

(d) Does not obstruct a drainage course; and

(e) Does not create unstable slopes.

(3) Grading for which a building permit cannot be issued shall require a grading permit issued by the SPGA.

C. Exemptions. The following activities do not require the issuance of a grading permit:

(1) Grading undertaken as part of a special permit or site plan reviews approved after the date of adoption of § 135-1201;

(2) Constructing a street shown on a subdivision plan endorsed by the Planning Board after the date of adoption of § 135-1201;

(3) Maintaining, resurfacing or reconstructing an existing street, provided said activity is supervised by the Town;

(4) Installing, reconstructing or repairing underground public utilities, provided said work shall be backfilled to existing grade upon completion of work or within 45 days after start of the work, whichever is sooner;

(5) Maintaining or reconstructing municipal parks, playgrounds and golf courses;

(6) Removing or replacing an underground storage tank that is subject to regulation by a state or federal agency;

(7) Excavating for geological investigation supervised by an RPE or licensed site professional, provided said work shall be backfilled to existing grade at the end of each work day;

(8) Maintaining a private driveway or accessway existing prior to the date of adoption of § 135-1201, provided said maintenance involves less than 150 cy of material;

(9) Maintaining existing private lawns, including adding or removing less than 12 cy/acre of topsoil, compost, sand, loam or other soil amendments in a calendar year, provided any increase in elevation shall not exceed six inches;

(10) Grading for construction of a single-family residence authorized by a valid building permit, provided that less than 150 cy earth material are removed or added to the site in connection with the building permit.

D. Denial of permit.

(1) The SPGA shall not issue a grading permit where the proposed grading:

(a) Would cause hazard to the public health, safety or welfare;

(b) Would endanger an adjoining lot, result in the deposition of debris or sediment on a public street, endanger public utilities or result in any hazard of contamination;

(c) Will occur in an area that is subject to geological hazard;

(d) Would foul, obstruct or impede the flow of any water body, drain or sewer.

(2) If it can be shown to the satisfaction of the SPGA that implementing mitigative measures can eliminate the hazard, a grading permit may be issued conditioned on the elimination of said hazard.

E. Emergency situation.

(1) If the Inspector of Buildings determines there is an immediate danger to the public health or safety from a landslide, flood, earthquake or other natural calamity requiring grading, he may authorize corrective action.

(2) If grading occurring under a grading permit creates an immediate danger to the public health or safety, the SPGA may revoke the grading permit or require corrective action.

F. Time frame.

(1) Grading shall be completed within the time frame specified in the grading permit or within 180 days if no time limit is specified.

(2) If an applicant presents satisfactory evidence that unusual circumstances have prevented completion of grading within the specified time, the SPGA may extend a grading permit one time only for a period not to exceed one year.

G. Procedures for application.

(1) A grading permit may be issued by affirmative vote of a majority of the SPGA only after a public hearing with public notice given in accordance with c. 40A § 11.

(2) Application for a grading permit shall include a grading plan and report prepared and stamped by an RPE.

The grading plan shall be of appropriate scale to show location and details of all proposed grading activities and shall include, where applicable:

(a) A general vicinity map, scale, North arrow, benchmark and datum;

(b) The legal names and addresses of the owner of the property involved, the petitioner and abutting property owners, including those across a street;

(c) Property lines, easements and dimensions, building setbacks and total area of the lot;

(d) Existing and finish grades at two-foot contours with the contour lines extended a minimum of 50 feet beyond the site's boundaries;

(e) Location, dimensions and elevation of existing and proposed buildings and structures, retaining walls, roads, driveways, parking lots, utilities and drainage structures on site and within 50 feet of the site's boundaries;

(f) Location of water bodies, wetlands, wetland buffers, floodplains, drainage structures and any proposed alteration to drainage on site and within 50 feet of the site's boundaries;

(g) Location of access streets, access points, and construction entrances;

(h) Location of graded areas, shaded and labeled "graded area," and of on-site disposal or borrow areas;

(i) Location of known soils and of geologic hazard areas on the site;

(j) Location of proposed erosion and sedimentation controls;

(k) Location of proposed mitigative measures such as revegetation, retaining walls and visual screening;

(l) Location of vegetation to be removed with number of trees/shrubs to be removed, retained or replanted;

(m) Plan details on utilities, drainage structures, walls, cribbing, dams, berms, settling ponds or other water control devices to be constructed;

(n) Slopes of all cut and fill areas;

(o) Cross section drawings (no fewer than two) that show:

[1] Maximum depth of fill and maximum height of cuts.

[2] Existing and proposed buildings and their setbacks from cut or fill slopes;

[3] Existing and finish grades extending a minimum of 20 feet beyond the scope of work;

[4] Retaining walls and the grade on either side of the walls for at least 20 feet.

The grading report shall include, where applicable:

(a) Description of the work to be performed under the grading permit;

(b) Start and completion dates;

(c) Quantities of earth materials impacted by grading and area to be graded;

(d) Description of erosion, drainage and dust control measures to be implemented;

(e) Location of off-site disposal areas and quantity of earth materials and vegetation to be removed from the site;

(f) Description of the type of backfill to be used, using ASTM Unified Soils Classification System for identification;

(g) Quantity of earth materials to be imported to the site during grading and the source of the material.

(3) If a project is so large or complex that a plan encompassing the total project cannot reasonably be prepared prior to initial groundbreaking, an applicant may seek authorization from the SPGA to undertake grading incrementally. Approval of phased grading activities shall take place in 2 steps:

(a) An overall conceptual plan of the entire development shall be submitted to the SPGA for review and approval.

(b) Detailed plans showing the nature and extent of the work to be completed during each phase shall be prepared by an RPE and submitted to the SPGA for review and approval.

(4) An applicant shall provide any additional information the SPGA may determine necessary for its review.

H. Grading standards.

(1) General grading standards.

(a) Grading shall not increase turbidity, siltation or pollution in a water body or create or contribute to landslides, accelerated soil creep, settlement, subsidence, flooding, erosion.

(b) Grading shall expose to erosion the smallest area of soil for the least possible time.

(2) Import and export of earth material.

(a) Site access shall be restricted to points designated on a plan and shall be controlled by a gate or other suitable barrier.

(b) Access drives shall have the minimum sight distance required under § 135-809. Absent the required sight distance police details shall be posted. Access drives shall be constructed of gravel or equivalent material to prevent mud and debris from being deposited onto access streets. The last 50 feet of an access drive's approach to the intersection with a public street shall have a grade less than 3%.

(c) When in excess of 150 cy of earth material is to be transported over a public street, the SPGA may restrict transporting to access streets and require:

[1] That water and/or dust palliative be applied to alleviate or prevent dust during loading or transport of said materials; and

[2] The posting of "Trucks Entering" signs on the public roadway 400 feet on each side of the site's access. The warning signs shall be covered or removed when the access intersection is not in use.

(3) Boundary location. The SPGA may require staking of property lines, limits of grading, top and toe of the fill and all areas where construction equipment is to be excluded. Stakes shall be at least two-inch by two-inch posts 36 inches in length above existing grade and shall be maintained and viable during grading activities.

(4) Clearing standards.

(a) Existing vegetation shall be preserved unless a grading permit authorizes removal of said vegetation.

(b) All natural drainageways shall be clearly marked, and a minimum buffer of 25 feet on each side of such drainageways shall remain undisturbed.

(c) Clearing activities shall be limited road or driveway construction, utility installation and building pad construction. Trees and areas of undergrowth to be removed shall be clearly identified on the grading plan. On site, clearing limits shall be clearly marked with brightly colored tape or plastic.

(d) Grading equipment shall be kept outside the drip line of any trees to be retained.

(e) Unauthorized removal of trees or other vegetation or the backfilling or compaction of soil around trees to be retained shall be a violation of § 135-1201 and require immediate restoration using five- to ten-year-old stock planted at a 3:1 ratio of new plants to removed or damaged plants.

(f) Filling of more than six inches shall require retaining walls around trees six inches in caliper or larger.

(5) Excavation.

(a) There shall be no excavation below designed finish grade except as needed for placement of reclamation materials.

(b) There shall be no excavation below the estimated seasonal height of the ground water table.

(6) Compaction.

(a) Nonstructural fill material shall be placed in twelve-inch uncompacted lifts and compacted throughout their full extent to 90% of the maximum dry density of the material used as determined by ASTM Method 1557 or approved equal.

(b) Structural fill material shall be placed in twelve-inch uncompacted lifts and compacted throughout their full extent to 95% of the maximum dry density as determined by ASTM Method 1557 or approved equal.

(c) Fill material for landscaping is exempt from compaction requirements.

(7) Drainage.

(a) Cut and fill slopes and terraces shall be provided with subsurface drainage as necessary for stability.

(b) Water shall not pond above cut or fill slopes or on drainage terraces. Drainage facilities shall be provided to prevent such ponding.

(c) Areas designed for buildings shall be graded away from the building for a minimum of six feet at a slope of 24 horizontal to one vertical.

(d) Dikes, swales, ditches, percolation devices or other conveyance mechanism shall be designed to control runoff and erosion from graded areas and to improve water quality by removing suspended solids. Where concentrated runoff

discharges onto natural ground, measures shall be taken to dissipate the energy and release the runoff as sheet flow.

(8) Encroachment.

(a) Grading shall not encroach upon an adjoining lot unless the SPGA is provided:

[1] Proof that the applicant owns the adjoining lot;

[2] An easement, granted by the owner of the lot, authorizing grading on said lot; or

[3] A letter signed by the owner of the lot authorizing temporary encroachment for a temporary change of grade or stockpiling.

(b) When grading alters an existing grade, adjoining lots shall be protected from encroachment or collapse by a retaining wall or by grading to a safe slope. The design for any retaining wall with an exposed height exceeding four feet at any point shall be stamped by an RPE acting within the area of his expertise.

(9) Erosion control. Grading shall comply with § 135-1203, Erosion control regulations.

(10) Expansive soils. If organic or soft cohesive soils are found within two feet of the finish grade of an intended building location, said soils shall be removed to a depth specified by an RPE and replaced with properly compacted nonexpansive gravel borrow.

(11) Fill material. The SPGA may specify the characteristics of the fill material used, including the degree of compaction, moisture content and method of placement. Fill material shall comply with the following:

(a) Fill materials shall be composed of earth materials. Rock or similar irreducible material used in fill shall be of a maximum diameter of six inches and shall compose not more than 20% of the total fill material.

(b) Fill materials shall not contain any organic material unless approved by the SPGA, any frozen or thawing material, solid waste, building debris, asphalt, concrete or hazardous waste or material.

(c) With the exception of the upper six inches of a fill site, topsoil shall not be used as a fill material.

(12) Setbacks.

(a) Cuts or fills five feet in depth or greater shall be set back a minimum of 25 feet from property lines. Setback distances shall be horizontal distances measured perpendicular to the site boundary.

(b) Fills shall be located so that the base edge of the fill is more than 12 feet horizontally from the top edge of an existing slope or a planned cut slope. Fill shall not be placed on top of slopes steeper than 1.5 horizontal to one vertical.

(c) The tops and toes of cut and fill slopes shall be set back from property lines as far as necessary for the safety of adjoining lots and to prevent damage resulting from runoff or erosion of the slopes.

(d) The setbacks specified above may be increased by the SPGA if necessary for safety and stability, to prevent damage to adjoining lots or to provide access for slope maintenance and drainage. Retaining walls may be used to reduce the required setbacks if approved by the SPGA.

(13) Slopes. All slopes shall conform to state and federal regulations. Cuts shall not be steeper in slope than two horizontal to one vertical. A steeper slope may be allowed if an RPE certifies that said slope will be stable, will not endanger an adjoining lot, deposit debris on a public way or interfere with any existing drainage course. The slope of cut and fill surfaces shall be no steeper than is safe for the intended uses.

(14) Surface preparation. The ground surface shall be prepared to receive fill by removing vegetation, noncomplying fill, topsoil and other unsuitable materials and by scarifying the ground surface to provide a bond for the new fill. A slope that is steeper than three horizontal to one vertical and the height of which is greater than five feet shall be benched into sound bedrock or other competent material as determined by an RPE. The bench under the toe of a fill shall be at least 10 feet wide, except when an RPE determines it to be unnecessary.

(15) Terraces.

(a) Terraces in soil at least four feet in width shall be established at not more than ten-foot vertical intervals on all cut and fill slopes to control surface drainage and debris. Where only one terrace is required, it shall be at mid-height. Terrace widths and spacing for cut and fill slopes greater than 90 feet in height shall be designed by an RPE. Suitable access to terraces shall be provided to permit cleaning and maintenance. This may be waived by the SPGA, provided documentation is provided by an RPE.

(b) Terraces in rock at least six feet in width shall be established at not more than thirty-foot vertical intervals on all cut and fill slopes to control surface drainage and debris. Where only one terrace is required, it shall be at mid-height. Terrace widths and spacing for cut and fill slopes greater than 90 feet in height shall be designed by an RPE. Suitable access to terraces shill be provided to permit cleaning and maintenance. This may be waived by the SPGA, provided documentation is provided by an RPE.

§ 135-1202. Quarry operations.

A. Coordination with grading regulations. An application for a special permit for a quarry operation shall comply with Braintree Zoning Bylaw § 135-1201. Where § 135-1202 has more stringent standards, § 135-1202 shall prevail.

B. Denial of permit. The SPGA shall not issue a special permit where a proposed quarry operation would:

(1) Cause hazard to the public safety or welfare, or constitute a nuisance;

(2) Produce noise or observable dust at the lot line in an amount detrimental to the normal use of an adjoining lot.

(3) Result in traffic hazard, particularly in residential areas, or congestion on or damage to public streets;

(4) Result in a change in topography or ground cover disadvantageous to the most appropriate use of the land;

(5) Cause surface or subsurface drainage to adversely affect an adjoining lot.

C. Standards for quarrying.

(1) No quarry operation shall occur within 250 feet of a property line or 300 feet of a public street as measured in a straight line from the street or property line to the area of the quarrying.

(2) Equipment used in a quarry operation shall not be located within 250 feet of a public street or property line.

(3) Topsoil shall be stripped to a depth of 12 inches and stored separately on site for use in reclamation.

(4) The area in which quarrying is taking place shall be clearly marked and posted with no-trespassing signs. The SPGA may require fencing or other barrier where excavations exceed a depth of four feet.

(5) The course or configuration of any drainageway or waterway shall not be changed unless approved by the SPGA. Quarry operations shall not cause the ponding of water unless authorized as part of a reclamation plan.

(6) Roadway maintenance.

(a) Roadways used for transportation of material must be swept clean and cleared of material spilled from trucks at least once each 48 hours, and more if required.

(b) Any repairs or cleaning of roadways performed by the Town as a result of the earth removal operation shall be paid for by the quarry operator.

(7) Within six months of termination of quarry operations, all buildings and structures used in quarrying shall be dismantled and removed at the expense of the quarry operators.

(8) If a quarry operation requires the use of explosives, a copy of the blaster's current license, bond and Town of Braintree permit shall be provided to the SPGA.

(9) The only materials that may be brought onto the site are explosives necessary for removal of earth materials and soil/landscaping materials needed to implement the approved reclamation plan.

D. Reclamation. Within six months of the termination of quarry activities, land areas that have been disturbed shall be reclaimed in accordance with a reclamation plan approved by the SPGA and with the following standards:

SECTION X

Attachment F

DESIGN STANDARDS - STORM DRAINAGE

A. General

The proposed storm water drainage system shall not contribute pollutants to existing storm water systems, surface waters or ground water on or off the site. The proposed storm water system shall also have no adverse impacts on adjoining lots by creating ponding, significant changes in the water table or increases in water discharge as noted herein. Storm water drainage systems shall implement "Best Management Practices" and conform to the guidelines described in these Rules and Regulations and Massachusetts Department of Environmental Protection [DEP] Stormwater Management Policy. Plans and calculations shall be developed in coordination with the Board, Planning Director, the Town Engineer and the Conservation Commission. The following objectives shall guide the design:

- ensuring public health and safety
- protecting abutting homes and property
- creating aesthetically pleasing designs which minimize disruption to existing natural and topographic features on the site and enhancing views of the natural environment
- ensuring no increase in the rate and volume of run-off from pre-development to post-development conditions
- prohibiting direct discharges into any water body or resource area
- enhancing ground water recharge and
- minimizing future maintenance of the system

B. Design Requirements

The storm drainage design shall be prepared by an RPE and his/her stamp shall appear on all drawings, computation sheets and working plans submitted to the Planning Board for review. If, in the opinion of the Board, a hazard exists or may exist from storm water runoff after construction of the subdivision, the Board may designate an area for storm water retention which shall not exceed 5% of the total undeveloped parcel. Said area shall be separate from the detention/retention area or volume of storage required to comply with other regulations in this section. Design of the storm water drainage system shall consider the entire tributary watershed.

C. Calculations

The applicant shall provide calculations demonstrating that the peak rate and volume of storm water run-off leaving the post-development site will not exceed that leaving the pre-development site for the 2-year, 10-year, 25-year and 100-year storm events. Design calculations to determine the size of all pipes, culverts and basins shall be submitted to the Board for review. Calculations shall be clearly organized, detailed and accompanied by a written narrative.

Sizing of the piping system shall be based on the Rational Method. Storm water run-off shall be determined by using methods developed by the U.S. Soil Conservation Service [SCS]. Drainage calculations shall include a drainage plan showing tributary areas, downstream areas affected by run-off, soil types and surficial cover characteristics [e.g., forest, grass, pavement] for both pre- and post-development conditions.

D. Drainage System

A complete storm drainage system shall be designed for each street. The drainage system shall intercept storm water from adjoining lots, permit unimpeded flow of all natural waterways, and eliminate undesirable or unnatural accumulation of water on any portion of the subdivision or surrounding property. The storm drainage system shall include pipes, catch basins, manholes, channels/swales, culverts, headwalls and all other related items that may be required to complete the system to the satisfaction of the Board. Should said system require connection to the municipal system on land outside the subdivision, proof of necessary easements must be provided to the Board.

E. Drainage Structures

1) Drains
Drainpipes shall be designed for the 25-year storm event. The minimum velocity at design flow will be 3' per second [fps] for pipes 36" and smaller and 2.5 fps for pipes 42" and larger. The maximum velocity for all pipes shall be 10 fps. A minimum of 2.5' of cover shall be required over drainpipes. Drainpipes shall be reinforced concrete [Class III minimum] and have a minimum diameter of 12". Where adjoining lots are not subdivided, provision shall be made for extension of the drainage system by continuing pipe to the boundary of the subdivision and providing a manhole for proper future connection.

2) Culverts
Culverts shall not be designed as drains with slope considerations. Culverts shall be designed for the 100-year storm event. Calculations to determine the size of the culvert as well as headwater, tailwater, entrance and discharge conditions must be provided. The minimum culvert size shall be 18". Culverts shall be reinforced concrete pipe [Class III minimum] or box culverts.

3) Headwalls
Concrete or rubble masonry headwalls shall be provided at both ends of culverts and the discharge ends of storm drains. Storm drain and culvert discharges should be designed with inverts above "normal tailwater" elevation. Headwalls shall be set on a minimum of 12" thick layer of .75" to 1.5" crushed stone. They shall conform in all respects to MHD specifications.

4) Scour/Erosion Protection
The discharge ends of all drains shall be protected with a rip rap apron having a width of not less than three times the nominal diameter of the pipe which shall extend not less than ten times the nominal pipe diameter from the end of the discharge pipe. Rip rap aprons shall consist of a layer of stone conforming to MHD specification M2.02.3. "Stone for Pipe Ends." Rip rap aprons shall be set on a minimum 12" thick base layer of .75" to 1.5" crushed stone and be of appropriate depth [thickness] to provide a stable and durable area to dissipate discharge velocities. Where the Board has approved exit velocities greater than 8 fps, a stilling basin of suitable design shall be provided in addition to the required rip rap aprons.

5) Channels/Swales
The 100-year storm event shall be used for design of channels/swales. When earth and stone-paved open channels/swales are used, the typical section should have a flat bottom and side slopes no steeper than 3:1 [horizontal to vertical] with the top of the slope at least 1' higher than the design water surface. The velocity allowed in an open earth channel/swale at design flow shall not exceed 6 fps. Whenever possible, channels/swales shall be grassed to promote aesthetics and contaminant removal.

6) Area Drains

Inlets shall have an adequate water way opening to pass the design runoff for a 25-year storm event with not more than 0.2' of surcharge. Grates and frames shall be cast iron suitable for the loads which can occur either during the construction or afterward. Inlets shall be constructed of reinforced pre-cast concrete sections conforming to MHD specifications. Inlets shall be set on a minimum 12" thick layer of .75" to 1.5" crushed stone. Inlets shall be used in offstreet locations and the grate frame shall be mortared in position with the top 0.2' below the grade of the surrounding finished ground surface. Area drains shall conform in all respects to MHD specifications.

7) Catch Basins

Drain inlets located in streets shall be reinforced pre-cast concrete catch basins with a minimum sump of 48". Catch basins shall be located in pairs, one on each side of the road, as required to collect the storm water runoff but shall not be spaced more than 300' apart unless otherwise approved by the Board. Catch basins shall be located along edges of pavement but shall not be located within driveway curb cuts or at sidewalk access ramps for persons with disabilities. Catch basins shall be set on a minimum 12" thick layer of .75" to 1.5" crushed stone. Series connections between catch basins shall not be allowed unless approved by the Board. Catch basins shall conform in all respects to MHD specifications.

8) Manholes

Manholes shall be constructed of reinforced pre-cast concrete and be provided with a solid cast iron frame and cover. A manhole shall be used at every change in pipe size or direction, either vertical or horizontal, and at all pipe intersections. Manholes shall be installed at intervals not to exceed 300'. The letter "D" at least 3" in size shall be cast into the manhole covers. Manholes shall be set on a minimum 6" thick layer of .75" to 1.5" crushed stone.

Manholes shall conform in all respects to MHD specifications. At manholes where the outlet pipe is larger than inlet pipe, the crown of the outlet pipe shall be at the same elevation or lower than the crown of the lowest inlet pipe. Where inlet and outlet pipes are of the same diameter, the crown of the outlet pipe shall be a minimum 0.2' below the crown of the inlet pipe. A shaped invert is not required but the bottom of the manhole shall be finished at the same grade as the outlet pipe invert.

9) Drainage Basins

Detailed plans for all detention/retention basins and pre-treatment basins are required. At a minimum, they shall include cross sections, soil profiles, seasonal high ground water elevation, storm water control structures, and emergency overflow. Drainage basins shall conform to the following requirements:

a) Bottom of basin shall be a minimum of 2' above seasonal high ground water level and shall be vegetated to promote filtration and removal of contaminants. Permanent standing water is discouraged unless the basin is located adjacent to or is hydrogeologically connected to a wetland or water body.

b) Pre-treatment shall be provided to remove contaminants from the storm water prior to entering a detention/retention basin. Contaminants to be removed include sediment, grit, oil and debris. Pre-treatment facilities may include lined siltation basins, sediment forebays, oil/water separators and oil/grit separators. Oil/water and/or oil/grit separators shall be provided for all parking lot drains with paved areas in excess of 1,000 square feet. No water will be permitted to recharge or leach into the ground without pre-treatment for removal of oil and sediment.

c) Basins shall be designed to retain the 100- year storm event with at least 1' of freeboard at the maximum water level. The 100-year storm water level shall be shown on the plans. All basins shall be designed with an emergency overflow spillway with appropriate erosion protection.

d) Retention facilities shall be designed to retain storm water for a minimum of 24 hours and dissipate within 72 hours based on the infiltration rate of the soil. Infiltration rate used for design shall be 25% of the measured percolation rate [e.g. percolation rate equals 2 min./in., infiltration rate equals 8 min./in.].

e) Test holes shall be required for all basins to determine soil profile and seasonal high ground water level. Percolation tests shall be required for any basin or leaching facility designed for recharge of storm water into the ground.

f) Detention basins shall be designed for optimum contaminant removal by maximizing the distance from inlet to outlet.

g) Side slopes in basins shall not exceed 3:1 [horizontal to vertical] and the maximum depth of a basin shall not exceed 5". Fences or vegetative screening around basins may be required by the Board.

h) Basins and associated outlet aprons and swales shall be incorporated into separate land parcels exclusively for purposes of storm water management.

i) An access road that allows maintenance equipment full access to the pre-treatment facility, detention/retention basin, inlets, outlets and emergency spillway shall be provided.

j) Basins shall have emergency outfalls with rip rap aprons to provide energy dissipation and erosion protection. Outfall invert elevations shall be above the 100-year storm water elevation.

k) A 50' buffer zone of existing vegetation shall be retained between all basin components and adjacent uses, structures and parcel property lines. A 30' buffer zone of existing vegetation shall be retained between all point source discharges of storm water and surface waters and/or wetlands.